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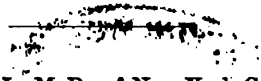

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GLOVER C. ARNOLD, M. D., of New York County.
WILLIAM B. EAGER, M. D., of Orange County.
J. W. S. GOULEY, M. D., of New York County.
JOHN H. HINTON, M. D., of New York County.
JOHN G. TRUAX, M. D., of New York County.
E. D. FERGUSON, M. D., of Rensselaer County, *ex officio*.

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TRANSACTIONS

OF

THE NEW YORK STATE MEDICAL ASSOCIATION,

FOR THE YEAR 1889.

VOLUME VI.

BOSTON MEDICAL LIBRARY ASSOCIATION
NOV 18 1891
OF NEW YORK COUNTY.

EDITED FOR THE ASSOCIATION

BY EDWARD K. DUNHAM, M. D.,

NEW YORK STATE MEDICAL ASSOCIATION
FOUNDED 1884

CONCORD, N. H.:
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OFFICERS AND COUNCIL FOR 1888–'89.

PRESIDENT.

WILLIAM T. LUSK, M. D., New York County.

VICE-PRESIDENTS.

FIRST DISTRICT, S. H. FRENCH, M. D., Montgomery County.
SECOND DISTRICT, R. C. McEWEN, M. D., Saratoga County.
THIRD DISTRICT, ELIAS LESTER, M. D., Seneca County.
FOURTH DISTRICT, THOMAS D. STRONG, M. D., Chautauqua County.

SECRETARY.

E. D. FERGUSON, M. D., Troy, Rensselaer County.

TREASURER.

J. H. HINTON, M. D., 41 West Thirty-Second St., New York City.

DIRECTOR OF THE LIBRARY.

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MEMBER OF THE COUNCIL AT LARGE.

ISAAC E. TAYLOR, M. D., New York County.

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FIRST DISTRICT, DOUGLAS AYRES, M. D., Montgomery County.
" " IRA H. ABELL, M. D., Jefferson County.
SECOND DISTRICT, J. B. HARVIE, M. D., Rensselaer County.
" " THOMAS WILSON, M. D., Columbia County.
THIRD DISTRICT, J. H. CHITTENDEN, M. D., Broome County.
" " H. O. JEWETT, M. D., Cortland County.
FOURTH DISTRICT, R. J. MENZIE, M. D., Livingston County.
" " SIMEON T. CLARK, M. D., Niagara County.
FIFTH DISTRICT, ALFRED L. CARROLL, M. D., New York County.
" " JOHN G. TRUAX, M. D., New York County.

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COMMITTEE OF ARRANGEMENTS FOR 1888–'89.

WILLIAM T. LUSK, President,
E. D. FERGUSON, Secretary,
Ex-Officio Members of the Committee.

JOHN G. TRUAX, Chairman.
CHARLES E. DENISON, Secretary.

E. S. F. ARNOLD,
GLOVER C. ARNOLD,
WILLIAM R. BALLOU,
ALFRED L. CARROLL,
JOHN W. S. GOULEY,
JOHN H. HINTON,
CHARLES A. LEALE,
J. R. MacGREGOR,
S. B. WYLIE McLEOD,
AUGUSTUS D. RUGGLES,
JOHN SHRADY,
ISAAC E. TAYLOR.

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OFFICERS AND COUNCIL FOR 1889–'90.

The Seventh Annual Meeting will be held in New York City, beginning the fourth Wednesday in October, 1890.

PRESIDENT.

JOHN G. ORTON, M. D., Binghamton, Broome County.

VICE-PRESIDENTS.

FIRST DISTRICT, DOUGLAS AYRES, M. D.,
Fort Plain, Montgomery County.

SECOND DISTRICT, M. H. BURTON, M. D.,
Troy, Rensselaer County.

FOURTH DISTRICT, E. M. MOORE, JR., M. D.,
Rochester, Monroe County.

FIFTH DISTRICT, WILLIAM B. EAGER, M. D.,
Middletown, Orange County.

SECRETARY.

E. D. FERGUSON, M. D., Troy, Rensselaer County.

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MEMBER OF THE COUNCIL AT LARGE.

GLOVER C. ARNOLD, M. D., New York, New York County.

ELECTED MEMBERS OF THE COUNCIL.

FIRST DISTRICT, WILLIAM H. BIGGAM, JR., M. D.,
Fort Plain, Montgomery County; term expires 1891.

" " CHARLES M. KLOCK, M. D.,
St. Johnsville, Montgomery County; term expires 1890.

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SECOND DISTRICT, THOMAS WILSON, M. D.,
Claverack, Columbia County; term expires 1891.
" " J. B. HARVIE, M. D.,
Troy, Rensselaer County; term expires 1890.
THIRD DISTRICT, H. O. JEWETT, M. D.,
Cortland, Cortland County; term expires 1891.
" " J. H. CHITTENDEN, M. D.,
Binghamton, Broome County; term expires 1890.
FOURTH DISTRICT, S. T. CLARK, M. D.,
Lockport, Niagara County; term expires 1891.
" " R. J. MENZIE, M. D.,
Caledonia, Livingston County; term expires 1890.
FIFTH DISTRICT, JOHN G. TRUAX, M. D.,
17 E. 127th St., New York, New York County; term expires 1891.
" DISTRICT, ALFRED L. CARROLL, M. D.,
30 W. 59th St., New York, New York County; term expires 1890.

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OFFICERS OF THE BRANCH ASSOCIATIONS FOR 1890.

FIRST OR NORTHERN BRANCH.

The Sixth Annual Meeting will be held at a place to be determined by the Executive Committee, on the Second Tuesday in July, 1890.

Officers.

President, DOUGLAS AYRES, M. D.,
Fort Plain, Montgomery County.
Secretary, EZRA GRAVES, M. D.,
Amsterdam, Montgomery County.

Executive Committee.

WILLIAM GILLIS, M. D., Fort Covington, Franklin County.
ISAAC de ZOUCHE, M. D., Gloversville, Fulton County.
THOMAS McGANN, M. D., Wells, Hamilton County.
W. D. GARLOCK, M. D., Little Falls, Herkimer County.
J. MORTIMER CRAWE, M. D., Watertown, Jefferson County.
ALBERT A. JOSLIN, M. D., Martinsburg, Lewis County.
H. M. LEACH, M. D., Glen, Montgomery County.
G. ALDER BLUMER, M. D., Utica, Oneida County.
E. F. MARSH, M. D., Fulton, Oswego County.
GUY REUBEN COOK, M. D., Louisville, St. Lawrence County.

SECOND OR EASTERN BRANCH.

The Sixth Annual Meeting will be held at Catskill, Greene County, on the fourth Tuesday in June, 1890.

Officers.

President, M. H. BURTON, M. D., Troy, Rensselaer County.
Secretary, C. H. BURBECK, M. D., Troy, Rensselaer County.

Executive Committee.

W. B. SABIN, M. D., West Troy, Albany County.
E. M. LYON, M. D., Plattsburgh, Clinton County.
J. W. LOCKWOOD, M. D., Philmont, Columbia County.
LYMAN BARTON, M. D., Willsborough, Essex County.

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A. H. GETTY, M. D., Athens, Greene County.
J. P. MARSH, M. D., Troy, Rensselaer County.
M. D. BABCOCK, M. D., Saratoga Springs, Saratoga County.
CHARLES HAMMER, M. D., Schenectady, Schenectady County.
WILLIAM HAGADORN, M. D., Gilboa, Schoharie County.
G. R. MARTINE, M. D., Glens Falls, Warren County.
A. J. LONG, M. D., Whitehall, Washington County.

THIRD OR CENTRAL BRANCH.

The Sixth Annual Meeting will be held at Syracuse, Onondaga County, on the third Tuesday in June, 1890.

Officers.

PRESIDENT, JOHN G. ORTON, M. D., Binghamton, Broome County.
SECRETARY, NATHAN JACOBSON, M. D., Syracuse, Onondaga County.

Executive Committee.

J. H. CHITTENDEN, M. D., Binghamton, Broome County.
W. R. LAIRD, M. D., Auburn, Cayuga County.
C. L. SQUIRE, M. D., Elmira, Chemung County.
LEROY J. BROOKS, M. D., Norwich, Chenango County.
F. W. HIGGINS, M. D., Cortland, Cortland County.
W. B. MORROW, M. D., Walton, Delaware County.
G. BIRDSALL, M. D., N. Brookfield, Madison County.
F. O. DONOHUE, M. D., Syracuse, Onondaga County.
B. A. CHURCH, M. D., Oneonta, Otsego County.
B. T. SMELZER, M. D., Havana, Schuyler County.
F. G. SEAMAN, M. D., Seneca Falls, Seneca County.
W. L. AYER, M. D., Owego, Tioga County.
WILLIAM FITCH, M. D., Dryden, Tompkins County.

FOURTH OR WESTERN BRANCH.

The Sixth Annual Meeting will be held in Buffalo, Erie County, on the second Tuesday in May, 1890.

Officers.

PRESIDENT, E. M. MOORE, JR., M. D., Rochester, Monroe County.
SECRETARY, WM. H. THORNTON, M. D., Buffalo, Erie County.

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EXECUTIVE COMMITTEE.

B. C. WAKELY, M. D., Angelica, Alleghany County.
V. A. ELLSWORTH, M. D., East Otto, Cattaraugus County.
WILLIAM CHACE, M. D., Mayville, Chautauqua County.
C. G. STOCKTON, M. D., Erie County.
M. W. TOWNSEND, M. D., Bergen, Genesee County.
J. P. BROWN, M. D., Tuscarora, Livingston County.
R. M. MOORE, M. D., Rochester, Monroe County.
S. T. CLARK, M. D., Lockport, Niagara County.
F. D. VANDERHOOF, M. D., Phelps, Ontario County.
JOHN H. TAYLOR, M. D., Holley, Orleans County.
N. M. PERRY, M. D., Troupsburgh, Steuben County.
J. N. ARNOLD, M. D., Clyde, Wagner County.
A. G. ELLINWOOD, M. D., Attica, Wyoming County.
D. M. SMITH, M. D., Penn Yan, Yates County.

FIFTH OR SOUTHERN BRANCH.

The Sixth Annual Meeting will be held in Brooklyn, Kings County, on the fourth Tuesday in May, 1890.

OFFICERS.

PRESIDENT, WILLIAM B. EAGER, M. D., Middletown, Orange County.
SECRETARY, E. H. SQUIBB, M. D., P. O. Box 94, Brooklyn, Kings County.

EXECUTIVE COMMITTEE.

J. G. PORTEOUS, M. D., Poughkeepsie, Dutchess County.
WM. McCOLLOM, M. D., Brooklyn, Kings County.
T. H. MANLEY, M. D., New York, New York County.
J. H. HUNT, M. D., Port Jervis, Orange County.
WILLIAM YOUNG, M. D., Cold Spring, Putnam County.
EDWIN WEBB, M. D., Hampstead, Queens County.
F. A. JOHNSTON, M. D., New Brighton, Richmond County.
WILLIAM GOVAN, M. D., Stony Point, Rockland County.
W. D. WOODEND, M. D., Huntington, Suffolk County.
T. W. BENNETT, M. D., Jeffersonville, Sullivan County.
H. VAN HOEVENBERG, M. D., Kingston, Ulster County.
R. J. SOUTHWORTH, M. D., Yonkers, Westchester County.

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LIST OF PRESIDENTS AND VICE-PRESIDENTS FROM THE FOUNDING OF THE ASSOCIATION.

1884.

PRESIDENT.

HENRY D. DIDAMA, M. D., Onondaga County, Third District.

VICE-PRESIDENTS.

FIRST DISTRICT, J. MORTIMER CRAWE, M. D., Jefferson County.
SECOND DISTRICT, TABOR B. REYNOLDS, M. D., Saratoga County.
FOURTH DISTRICT, B. L. HOVEY, M. D., Monroe County.
FIFTH DISTRICT, NATHANIEL C. HUSTED, M. D., Westchester County.

1885.

PRESIDENT.

*JOHN P. GRAY, M. D., Oneida County, First District.

VICE-PRESIDENTS.

SECOND DISTRICT, WILLIAM H. ROBB, M. D., Montgomery County.
THIRD DISTRICT, JOHN G. ORTON, M. D., Broome County.
FOURTH DISTRICT, JOSEPH C. GREENE, M. D., Erie County.
FIFTH DISTRICT, *JOSEPH C. HUTCHISON, M. D., Kings County.

1886.

PRESIDENT.

E. M. MOORE, M. D., Monroe County, Fourth District.

VICE-PRESIDENTS.

FIRST DISTRICT, WILLIAM GILLIS, M. D., Franklin County.
SECOND DISTRICT, H. C. VAN ZANDT, M. D., Schenectady County.

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THIRD DISTRICT, *FREDERICK HYDE, M. D., Cortland County.
FIFTH DISTRICT, J. G. PORTEOUS, M. D., Dutchess County.

1887.

PRESIDENT.

*ISAAC E. TAYLOR, M. D., New York County, Fifth District.

VICE-PRESIDENTS.

FIRST DISTRICT, JOHN P. SHARER, M. D., Herkimer County.
SECOND DISTRICT, L. C. DODGE, M. D., Clinton County.
THIRD DISTRICT, GEORGE W. AVERY, M. D., Chenango County.
FOURTH DISTRICT, DARWIN COLVIN, M. D., Wayne County.

1888.

PRESIDENT.

JOHN CRONYN, M. D., Erie County, Fourth District.

VICE-PRESIDENTS.

FIRST DISTRICT, BYRON DE WITT, M. D., Oswego County.
SECOND DISTRICT, ROBERT SELDEN, M. D., Greene County.
THIRD DISTRICT, CHARLES W. BROWN, M. D., Chemung County.
FIFTH DISTRICT, EDWIN BARNES, M. D., Dutchess County.

1889.

PRESIDENT.

WILLIAM T. LUSK, M. D., New York County, Fifth District.

VICE-PRESIDENTS.

FIRST DISTRICT, S. H. FRENCH, M. D., Montgomery County.
SECOND DISTRICT, R. C. McEWEN, M. D., Saratoga County.
THIRD DISTRICT, ELIAS LESTER, M. D., Seneca County.
FOURTH DISTRICT, THOMAS D. STRONG, M. D., Chautauqua County.

*Deceased.

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LIST OF FELLOWS REGISTERED AT THE SIXTH ANNUAL MEETING IN NEW YORK CITY,

Held September 25, 26, and 27, 1889.

FIRST DISTRICT.

MONTGOMERY COUNTY.

Douglas Ayres, Fort Plain.
William H. Biggam, Fort Plain.
Ezra Graves, Amsterdam.
R. G. Johnson, Amsterdam.
William H. Robb, Amsterdam.

SECOND DISTRICT.

CLINTON COUNTY.

L. C. Dodge, Rouse's Point.

GREENE COUNTY.

O. G. Selden, Catskill.
Robert Selden, Catskill.

RENSSELAER COUNTY.

M. H. Burton, Troy.
William C. Cooper, Troy.
William S. Cooper, Troy.
E. D. Ferguson, Troy.
J. B. Harvie, Troy.
George E. Lyon, Troy.
J. P. Marsh, Troy.
C. E. Nichols, Troy.

SCHENECTADY COUNTY.

Robert Fuller, Schenectady.
George E. McDonald, Schenectady.
H. C. Van Zandt, Schenectady.

THIRD DISTRICT.

BROOME COUNTY.

C. W. Greene, Chenango Forks.
John G. Orton, Binghamton.

CAYUGA COUNTY.

J. D. Tripp, Auburn.

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CHEMUNG COUNTY.

Charles W. Brown, Elmira. C. L. Squire, Elmira.

CHENANGO COUNTY.

Leroy J. Brooks, Norwich. George Douglas, Oxford.

CORTLAND COUNTY.

H. O. Jewett, Cortland.

DELAWARE COUNTY.

William B. Morrow, Walton.

ONONDAGA COUNTY.

H. D. Didama, Syracuse.

OTSEGO COUNTY.

J. K. Leaning, Cooperstown.

SENECA COUNTY.

George A. Bellows, Waterloo. Elias Lester, Seneca Falls.

FOURTH DISTRICT.

CHAUTAUQUA COUNTY.

W. P. Bemus, Jamestown. Thomas D. Strong, Westfield.

ERIE COUNTY.

John Cronyn, Buffalo. Thomas M. Johnson, Buffalo.
Clayton M. Daniels, Buffalo. Roswell Park, Buffalo.
George E. Fell, Buffalo. W. H. Thornton, Buffalo.

GENESEE COUNTY.

M. W. Townsend, Bergen.

MONROE COUNTY.

B. L. Hovey, Rochester. E. M. Moore, Jr., Rochester.
E. M. Moore, Rochester. R. M. Moore, Rochester.

NIAGARA COUNTY.

S. T. Clark, Lockport.

ONTARIO COUNTY.

F. D. Vanderhoof, Phelps.

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WAYNE COUNTY.

Darwin Colvin, Clyde.
N. E. Landon, Newark.
J. A. Sprague, Williamson.

WYOMING COUNTY.

Albert G. Ellinwood, Attica.
D. W. Rudgers, Perry.

FIFTH DISTRICT.

DUTCHESS COUNTY.

Edwin Barnes, Pleasant Plains.
Guy Carlton Bayley, Poughkeepsie.
William Cramer, Poughkeepsie.
Irving D. LeRoy, Pleasant Valley.
R. C. Van Wyck, Hopewell Junction.

KINGS COUNTY.

George W. Baker, Brooklyn.
Stuart A. Benton, Brooklyn.
J. C. Bierwirth, Brooklyn.
A. H. Brundage, Brooklyn.
Joseph Creamer, Brooklyn.
James F. Feely, Williamsburgh.
W. F. Gardiner, Brooklyn.
N. W. Leighton, Brooklyn.
T. M. Lloyd, Brooklyn.
William McCollom, Brooklyn.
E. J. C. Minard, Brooklyn.
Nelson L. North, Brooklyn.
Arthur R. Paine, Brooklyn.
Susan R. Pray, Brooklyn.
Henry B. Reed, Brooklyn.
Henry F. Risch, Brooklyn.
J. D. Rushmore, Brooklyn.
William G. Russell, Brooklyn.
E. H. Squibb, Brooklyn.
E. R. Squibb, Brooklyn.
Hermann O. C. Steinke, Brooklyn.
J. D. Sullivan, Brooklyn.
William Henry Thayer, Brooklyn.
George Wieber, Brooklyn.
William H. Williams, Brooklyn.

NEW YORK COUNTY.

Thomas H. Allen, New York.
E. S. F. Arnold, New York.
Glover C. Arnold, New York.
William R. Ballou, New York.
James Bathgate, Morrisania.
Hermann M. Biggs, New York.
Nathan Bozeman, New York.
Joseph D. Bryant, New York.
C. Stedman Bull, New York.
Alfred L. Carroll, New York.
T. M. Ludlow Chrystie, New York.
John F. Codmann, New York.
C. E. Denison, New York.
Ellery Denison, New York.
William Detmold, New York.
A. Palmer Dudley, New York.
Edward K. Dunham, New York.
William H. Flint, New York.
Guido Furman, New York.
John P. Garrish, New York.
J. W. S. Gouley, New York.
J. H. Hinton, New York.
Martha C. Holmes, New York.
Dwight L. Hubbard, New York.

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S. T. Hubbard, New York.
J. E. Janvrin, New York.
F. G. Kneer, New York.
George Knipe, New York.
Charles A. Leale, New York.
Robert Lewis, New York.
Anna Lukens, New York.
William T. Lusk, New York.
T. H. Manley, New York.
F. F. Marshall, New York.
David Mathews, New York.
John P. McGowan, New York.
S. B. W. McLeod, New York.
G. C. H. Meier, New York.
S. E. Milliken, New York.
R. L. Miranda, New York.
H. W. Mitchell, New York.
John Murphy, New York.
S. J. Murray, New York.
Robert Newman, New York.
Benjamin F. Ochs, New York.
John Parsons, Kings Bridge.
S. S. Purple, New York.
G. J. de Quesada, New York.
Harris C. Rodgers, New York.
A. D. Ruggles, New York.
L. A. Sayre, New York.
L. H. Sayre, New York.
R. H. Sayre, New York.
John Shrady, New York.
John W. Small, New York.
J. G. Truax, New York.
J. G. Wallach, New York.
Francis V. White, New York.
William T. White, New York.
C. S. Wood, New York.

ORANGE COUNTY.

Milton C. Conner, Middletown.
W. B. Eager, Middletown.

RICHMOND COUNTY.

F. U. Johnston, New Brighton.
J. J. Kinyoun, Stapleton.

ROCKLAND COUNTY.

William Govan, Stony Point.

ULSTER COUNTY.

H. Van Hoevenberg, Kingston.

WESTCHESTER COUNTY.

Edward F. Brush, Mount Vernon.
R. J. Southworth, Yonkers.
N. C. Husted, Tarrytown.

SUMMARY BY DISTRICTS OF FELLOWS REGISTERED.

First District,	5
Second District,	16
Third District,	13
Fourth District,	20
Fifth District,	100
Total,	154

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DELEGATES FROM OTHER MEDICAL ORGANISATIONS AND INVITED GUESTS IN ATTENDANCE.

U. S. Navy.

H. J. BABIN, M. D., Ship Vermont, . . . Invited Guest.

Canada.

T. G. RODDICK, M. D., Montreal, ... Invited Guest.

Connecticut.

CURTIS H. BILL, M. D., Bridgeport, . . . Delegate.
J. FRANCIS CALEF, M. D., Cromwell, . . . Delegate.
W. H. CARMALT, M. D., New Haven, . . . Delegate.
N. E. WORDIN, M. D., Bridgeport, . . . Invited Guest.

Massachusetts.

HENRY O. MARCY, M. D., Boston, . . . Invited Guest.

New Jersey.

JOHN H. BRADSHAW, M. D., Orange, . . . Invited Guest.
T. R. CHAMBERS, M. D., East Orange, . . Invited Guest.
WILLIAM PIERSON, M. D., Orange, . . . Invited Guest.

New York.

D. M. TOTMAN, M. D., Syracuse, ... Invited Guest.

Pennsylvania.

WM. B. ATKINSON, M. D., Philadelphia, . . Invited Guest.
WILLIAM GOODELL, M. D., Philadelphia, . . Invited Guest.
ROBERT W. STEWART, M. D., Pittsburgh, . . Invited Guest.
GEORGE A. WESTFALL, M. D., Milford, . . Delegate.

Rhode Island.

J. W. MITCHELL, M. D., Providence, . . . Delegate.

Vermont.

F. W. GOODALL, M. D., Bennington, . . . Delegate.

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ADDRESS OF WELCOME AND REPORT OF THE COMMITTEE OF ARRANGEMENTS.

By J. G. Truax, M. D., of New York County, Chairman of the Committee.

September 25, 1889.

Gentlemen: In the name of the Council, and as chairman of the Committee of Arrangements, I bid you welcome.

It has been my privilege to be able to attend the annual meetings of this Association for the past few years. Those of you who have been present at these meetings will agree with me in the statement that they have been both interesting and instructive. The arrangement of the papers and discussions has made quite a favorable impression upon medical men outside of the Association. So favorable has been this impression, that other medical societies have followed our example in many particulars in the arrangement of the programmes for their meetings.

That this meeting may not prove less interesting or instructive than have the others, is the object for which your Committee of Arrangements has laboured during the past year. A reading of the programme will convince one that the Fellows who have sacrificed so much of their time and means, and endured the fatigue necessarily connected with a journey to this city, will be repaid.

There has been no meeting of this Association in the past but that some fact has been made known for the first time, or an old one so thoroughly analyzed as to remove it almost entirely from the realm of theory. If titles and names are of any value, we have reason to expect much from this, the sixth annual meeting of the New York State Medical Association.

There are to be three addresses,—one on Surgery, by Dr.

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Francis Bacon, of Connecticut; one on Medicine, by Dr. Edward K. Dunham, of New York; and one on Tubal Pregnancy, by Dr. William T. Lusk, of New York.

The discussions will be upon the following three subjects:

First—Tubal Pregnancy. This discussion will be opened by William T. Lusk, M. D., of New York county.

Second—Treatment of Hernia. This discussion will be opened by Joseph D. Bryant, M. D., of New York county.

Third—The New Hypnotics. This discussion will be opened by William H. Flint, M. D., of New York county.

A reference to the programme will give any information desired as to the time of, and persons connected with, the discussion of each subject.

Altogether there are thirty subjects, to be considered by fifty-three speakers.

These contributions come from four of the geographical districts of this state, and from four sister states, in the following proportion:

First District,	1
Second "	0
Third "	6
Fourth "	9
Fifth "	29
State of Pennsylvania,	4
State of Kentucky,	1
State of Connecticut,	2
State of Massachusetts,	1
	53

In the five districts, Fellows of the Association from seven counties contribute essays in the following proportion:

First District,	Montgomery	County,	1
Second "			0
Third "	Chemung	"	4
" "	Onondaga	"	2

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Fourth District,	Erie County,	. . . . .	8
" "	Wayne "	. . . . .	1
Fifth "	Kings "	. . . . .	3
" "	New York County,	. . . .	26
			45

The thirty scientific contributions, classified in accordance with their subjects, are as follows:

12 on medicine.
8 on general surgery.
10 on special surgery.

30

In order that there may be sufficient time afforded for the presentation of these contributions, your committee have provided that there shall be two night sessions in addition to the three regular morning and afternoon sessions. The morning sessions will be opened at nine o'clock, the afternoon sessions at half past one, and the evening sessions at seven thirty.

Since the distribution of the official programme, the following additions have been made:

Shadow Line of Insanity, by John Shrady, M. D., of New York county.

The Rational Treatment of the Umbilical Cord of the Newborn, by Henry F. Risch, M. D., of Kings county.

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PRESIDENT'S ANNUAL ADDRESS—TUBAL PREGNANCY.

By WILLIAM T. LUSK, M. D., of New York County.

September 25, 1889.

CASE I. TUBAL PREGNANCY, RUPTURE, LAPAROTOMY, RECOVERY. On the 19th of November, 1888, I was summoned in haste to the bedside of Mrs. S., 19 years of age, who was suffering from shock and intense anaemia.

Of her history, I learned that she had been three years married, and that a year previous she had given birth to a dead child at term. Since her confinement she had suffered from profuse leucorrhoea and pain in the right inguinal region. The patient had passed two menstrual periods, but had had no subjective symptoms of pregnancy. On the 10th of November she noticed a sero-sanguinolent discharge from the vagina. On the 11th she was seized with cramps, associated with faintness, with nausea, and at times with vomiting. There was no intestinal disturbance to which the abdominal pains could be referred. Similar attacks, but of less intensity, occurred daily, usually in the morning hour, up to the 18th inst. On that date the pains had been unusually severe, when suddenly Mrs. S. became exsanguinated, and syncope ensued, which lasted about twenty minutes. On recovering consciousness she felt chilly and restless, with constant nausea and vomiting.

At Dr. Janeway's suggestion, on the evening of the 19th inst. I was sent for by Dr. Agan, the family physician. As I have stated, I found the patient excessively anaemic; vomiting was constant; pulse was 140; the abdominal pains had ceased. On vaginal examination, the uterus was found to be pressed somewhat to the left. At the sides, and posterior to the uterus, irregular masses of a soft consistency could be felt, which obscured the palpation of the uterine appendages.

The diagnosis was ruptured tubal pregnancy, with intra-peritoneal haemorrhage, a diagnosis which was farther confirmed by the expulsion of a decidual membrane on the 20th inst. Laparotomy was recommended; and the next day, in spite of the patient's feeble condition, she was conveyed by ambulance to the St. Vincent's hospital. She arrived in a state of prostration, which seemed to afford little hope of a rally. During the night Dr. Mitchell, the house-physician, watched at her bed-

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side, and administered hourly one ounce of whiskey, and five drops of tincture of digitalis every two hours. By eight in the morning the patient's condition had greatly improved. Her pulse had fallen to 100, and possessed more volume.

At 10 A. M. the patient was carried to the operating-room. Operation was performed under ether, with the usual antiseptic precautions. When the peritonaeum was incised, a stream of dark fluid blood, probably not less than two quarts in quantity, gushed out. On introducing the hand, I found the pelvic cavity filled with clots, which I carefully removed. The tube on the left side was enlarged near the fimbriated extremity. On lifting it out of the abdomen the haemorrhage was seen to proceed from a sac in the broad ligament, which had ruptured into the peritoneal cavity. A strong silk ligature (Staffordshire knot) was made to include the tube, sac, and ovary on the left side. The ligatured mass was removed by the thermo-cautery, and the pedicle dropped. The right tube and ovary appeared perfectly healthy. The abdominal cavity was then irrigated with Thiersch's solution, was rapidly sponged, and a large drainage tube was introduced. The usual antiseptic dressings were employed. The operation lasted about forty-five minutes. By noon the patient had rallied, and expressed herself as feeling perfectly comfortable. In the afternoon, while vomiting, so large an amount of bloody fluid was forced from the drainage-tube that at first it was feared a fresh bleeding had taken place. It was noticed, however, that, as regarded her general condition, the patient was progressively improving; so it was decided to await events in place of reopening the abdomen. The next morning the quantity of fluid removed from the tube at each change of dressings had fallen to a drachm or two, and was more serous in character. However, it was four days before all color had disappeared and the tube was finally removed.

It is to be assumed that the bloody discharge was due to imperfect syphoning of fluid from the abdomen after irrigation, and not to an after haemorrhage. The sudden expulsion of the retained fluid during the act of vomiting was, I believe, a lucky accident, which contributed to smooth the path of convalescence.

In the afternoon of the first and in that of the second day, the temperature rose to 100° F., with a pulse of 116: with these exceptions the temperature remained below 100°. The pulse, for a few days, at times was in the neighborhood of 100; generally less. At the end of the week it possessed about the normal frequency.

At 2:30 P. M. of the day of operation a tea-spoonful of strong tea

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was given to the patient by mouth every ten minutes, and one quarter of a teaspoonful of brandy every twenty minutes. By rectum, brandy ℥i, Tr. opii gtt. xv, Aq. ℥iij was given every four hours. (The patient had no pain. The opium was given solely on account of the cerebral anaemia, and was discontinued at the end of twenty-four hours.)

After the effects of the ether wore off, all vomiting ceased. The patient was thirsty, and took carbonated waters freely by the mouth. On the third day she took two ounces of brandy and two ounces of milk every two hours in addition to the rectal enemata. On the fourth day, toast, boiled rice, eggs, coffee, and tea were given, and were eaten with relish. Convalescence was uninterrupted. The patient slept well, all the natural functions were normally performed, and she rapidly regained color. On December 4 the patient was permitted to sit up in a chair. On December 17 the external wound and the sinus resulting from the tube had entirely healed, and the patient returned to her home. A month later she was able to go to a ball and dance all the evening with enjoyment. Her health since the operation has been better than at any time previous in her life.

The illustration herewith presented represents a longitudinal section through the specimen after it had been subjected to a hardening process by Dr. Dunham of the Carnegie Laboratory. A certain amount of shrinkage has taken place, so that the specimen is perhaps not more than three fourths its original size. The embryo corresponds to about the sixth week. A clot surrounds the walls of the ovum, and above has so far thinned the tubal walls that it appears to be covered by peritonaeum only. Rupture, however, had taken place below. At first a haematoma had formed between the folds of the broad ligament. The distension caused by the effused blood had converted the posterior layer at the point of pressure into a sac, in which, at the time of operation, an opening was found of about the size of a man's thumb. The clots in this sac were much softer than that which surrounded the ovum.

If we attempt to follow the sequence of events in this case, it would appear that haemorrhage into the tube occurred first, and corresponded to the symptoms experienced on the 11th of November, when the patient suffered from cramps, faintness, and nausea. The thinning of the tubal walls was

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such that the non-occurrence of intra-peritoneal rupture at that time was almost in the nature of a miracle. Possibly

the timely formation of the clot served as a protection. If the rupture of the tube was coincident with the occurrence of the first haemorrhage, the separation of the folds of the

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broad ligament and the formation of the pouch probably took place gradually. Until the 18th inst., the patient experienced cramp-like pains; but she kept her color, and had no symptoms that made her feel apprehensive. The sudden anaemia and prolonged unconsciousness at that date marked the rupture of the sac and the pouring of the blood into the peritoneal cavity. Subsequently the feeble heart action and the formation of clots in the pelvis doubtless served as a temporary check to the bleeding from the opened vessels.

CASE II. TUBAL PREGNANCY, RUPTURE, LAPAROTOMY, DEATH FROM BRIGHT'S DISEASE ON THE EIGHTH DAY. Mrs. K., aged 36, had given birth to nine children at term, and had had two miscarriages. Her labors had all been easy ones. Her general health previous to the occurrence which was the cause of my first visit had been good. There was no history of constitutional trouble, nor had she been conscious in the past of any pelvic suffering. On the 31st of May, without warning, she was seized with a violent attack of pain followed by blanching of the surface, and syncope which lasted for several hours. For a time Dr. McSweeney, the family physician, had little hope that restoration could be effected, but she finally rallied. The next day (June 1) Dr. Janeway and myself were invited by Dr. McSweeney to see Mrs. K. with him in consultation. We found her extremely anaemic, with blanched lips, rapid, feeble pulse, and great prostration, but not suffering greatly from pain. She stated that she had menstruated last about six weeks previous, and had supposed herself pregnant. The undoubted occurrence of intra-peritoneal haemorrhage led to the strong suspicion of ruptured tubal pregnancy. There had been, however, no antecedent symptoms, *i. e.*, no colicky pains, no sero-sanguinolent discharge, no expulsion of decidua. The presence of clots in the pelvis obscured the palpation of the pelvic organs. Still, Dr. Janeway and Dr. McSweeney and myself believed that we could recognise an enlargement of about the size of an egg in the course of the left tube.

On the morning of June 2 the patient was conveyed by ambulance to the St. Vincent's hospital. Stimulants were freely administered. Laparotomy was performed in the afternoon. Unfortunately no formal notes were taken at the time, but the history of the operation was a repetition of that of the case already given. The abdominal cavity contained a large amount of fluid blood, the pelvis was filled with clots, and the tube on the left side was found ruptured on its posterior surface above the folds of the broad ligament. The rupture was caused by an ovum which presumably had attained four weeks of development. Through the rent the villi were beautifully apparent.

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The operation was unusually free from difficulty, and lasted hardly more than a half hour. The patient rallied well. In the evening her general condition was most promising, save in one respect, viz., the water passed in the afternoon contained over fifty per cent. of albumin. During the succeeding days there was little or no fever (temperature rose to 103° F. for a brief period on the second day), there was no pain, the appetite was good, but the albuminuria persisted. Still the general progress of the case was so favorable that recovery was regarded as certain. On Saturday (seventh day), however, the urine, which had previously ranged between eighteen and thirty ounces, began to diminish in quantity, and in a short time sank to a few drachms, which became solid on boiling. Death from uraemia occurred on the eighth day.

These two cases illustrate the ordinary history of tubal pregnancy. In both, without antecedent symptoms, at an early period of gestation rupture with haemorrhage takes place, in the one instance the blood primarily making its way between the folds of the broad ligament, in the other, pouring suddenly, without check, directly into the peritoneal cavity. They are simply additions to the long list already furnished by Mr. Lawson Tait, upon which he has based his scheme of ectopic gestations.

In Mr. Tait's belief all cases of extra-uterine pregnancy are *ab initio* of tubal origin. When the ovum develops in the free part of the tube, rupture, he holds, occurs at or before the fourteenth week. If rupture occurs at once into

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the abdominal cavity, death ensues from haemorrhage, or, later, from suppuration of the sac and peritonitis. If rupture takes place in the lower portion of the tube, between the folds of the broad ligament, the ovum may develop to full term; may die, and be absorbed as an extra-peritoneal haematocele; may suppurate, and be discharged at or near the navel, or through the bladder, the vagina, or intestinal tract; may remain quiescent, as a lithopaedion; or may become an abdominal pregnancy by secondary rupture. In the tubo-uterine form death occurs from intra-peritoneal rupture before the fifth month. Mr. Tait denies the possibility of a primary abdominal pregnancy. The ovarian form he regards as possible, but not proved.

There is no question as to the utility of Mr. Tait's scheme. It is based upon his exceptional personal experience, and has received substantial support from the observations of others. It has stimulated active inquiry, and has given proper direction to pathological study; but the subject of ectopic pregnancy is still too new to make it possible for any scheme to be regarded as a finality.

The most interesting outcome of Mr. Tait's work has been the change of view as regards the existence of primary abdominal pregnancy. An overhauling of museum specimens long believed to establish this variety has so far furnished very nearly negative results, and there is at present a very general agreement that the reported cases are at least open to grave suspicion. It is not *a priori* likely that an ovum immediately after fecundation is capable of forming nutrient connections with the peritoneum. It is not theory, however, but facts, with which we are called upon to deal. The discovery of an ovum growing in the peritoneal cavity, with the tubes and ovaries demonstrably intact, would suffice to establish the abdominal variety. In the early months, before the anatomical conditions are obscured by secondary changes, there is no pretence that such proof has been obtained. In more advanced stages, a good many cases of assumed abdominal pregnancy have been placed in evidence.

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These, so far as my investigations permit me to judge, are divisible into two classes:

First. Cases where the tubes are reported as intact, but in which there exists a direct communication between the tube upon the affected side and the sac cavity. Thus Treub, of Leipsic, recently reports the following instance:

Patient menstruated last about the middle of April, 1887; peritonitic pains, with symptoms of internal haemorrhage, on the 12th of June. At the end of July the same symptoms occurred, but were more violent. Ballottement was distinct by the end of September. Life was felt a week later. There were no foetal movements after November 24. Septic symptoms developed, and laparotomy was performed January 22, 1888, when the patient was nearly moribund. Death ensued the following night.

At the autopsy the adnexa on the right side were normal. The left tube measured ten and a half centimeters, which corresponded to the length of the right tube. It was pervious throughout its entire extent. The fimbriated outer end communicated with the sac. There was no apparent distension of the abdominal end of tube. The sac of the ovum was adherent to the posterior surface of the uterus and of the broad ligament, to a few coils of intestines, to the sigmoid flexure, and to the rectum.

Abdominal pregnancy was assumed by Treub because the tube had its normal length and its natural direction, while the placenta was attached to the posterior sac wall, which contained no muscular elements even in the vicinity of the tube; but it is much more natural to suppose that a fecundated ovum occupying the infundibulum ruptured the tube walls at an early period of its growth, and thence continued its development between the folds of the broad ligament. It will be remembered that there were unmistakable symptoms of internal haemorrhage in June and in July. The length of the left tube does not affect the question, as Werth[1] furnishes cases of unmistakable intra-ligamentous development where the same feature was noted.

[1] Werth, "Beitrige zur Anatomie und zur Operativen Behandlung der Extrauterinschwangerschaft," 1887. *Vide* table A, containing sixteen cases of intra-ligamentous tubal pregnancy. In No. 9, Scott's case, the length of the tube was given at six inches; in No. 12, Dreesen's case, at fifteen centimeters; in No. 15, Martyn's case, the statement is made that the tube was enormously increased in length.

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Second. Cases where the tubes are reported as intact and not in communication with the sac. Few of these merit criticism. Lately, however, new interest has been excited as to the possibility of primary abdominal pregnancy by a case operated upon in 1879 by Prof. Müller, of Bern.[1] Extra- and intra-uterine pregnancy existed at the same time. At the eighth month spontaneous expulsion of the intra-uterine foetus took place. The extra-uterine ovum was removed by laparotomy. Death ensued from haemorrhage. The post mortem investigation was conducted by Walker, who, in a carefully prepared essay, concludes that the case was a typical one of abdominal pregnancy. The tubes and ovaries were in contact, but not adherent to the sac. The latter had started originally from the bottom of the cul-de-sac of Douglas, and only in the course of its subsequent development had reached the uterine appendages. The correctness of the author's deductions has not, however, passed unchallenged, most of the recent reviewers regarding the history as indicating a tubal origin.

Schlectendahl[2] reports the discovery of an ovum near the spleen, containing a foetus measuring fifteen centimeters in length, in a woman who had died from internal haemorrhage. The sac was the size of a man's fist, and was surrounded by adherent intestines. The uterus and tubes appeared normal. The value of this case as evidence on behalf of abdominal pregnancy has been denied, but the facts related by Schlectendahl certainly call for explanation.

There is little question as to the occasional occurrence of ovarian pregnancy. The specimen discovered by Patenko[3] in the Museum of Pathological Anatomy at St. Petersburg seems to answer all the requirements of a demonstration. The right ovary was of the size of an egg, and contained a cyst with smooth walls, filled with serum. In this he found a body of a yellow color, the size of a hazel-nut, which con-

[1] Zur Casuistik der Extrauterinschwangerschaft. Arch. f. Gynaek., Vol. xxx, p. 70, and Walker, Der Bau der Eihäute bei Graviditas Abdominalis. Virchow's Arch., Vol. 107.

[2] Schlectendahl, Ein Fall von Graviditas Abdominalis. Frauenarzt, 1887. No. 2.

[3] Patenko, Casuistische Mittheilungen. Arch. f. Gynaek. Vol. xiv, p. 156.

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tained cylindrical and flat bones. The most careful microscopical examination established the fact that the bones were those of a foetus, and not merely the chance products of a dermoid cyst. The presence of corpora lutea and follicles in the walls of the envelope proved that the body was an ovary. The tube on the corresponding side was nowhere adherent to the sac. The abdominal extremity was closed, and there were no traces of fimbriae.[1]

Paltauf[2] relates a case of extra-uterine pregnancy in which there was a sacculated condition of both tubes which communicated with a cyst of ovarian origin. The ovaries were closely united. By means of the ovarian cyst a complete communication was established between the two tubes. In the large central ovarian cyst a clot was found which contained an embryo corresponding in size and to one of from forty-five to forty-eight days' development. The origin of the condition here met with is naturally a matter of speculation.

But these exceptional cases, however interesting, play an unimportant rôle in the history of ectopic pregnancy. It is the tubal form that not only relatively to the others, but actually, is of common occurrence. Its pathology, its diagnosis and treatment, are among the pressing questions of the day.

The physiology of conception, so far as known, consists in the discharge of the ovum from the ovary through rupture of a Graafian follicle, its entrance into the Fallopian tube by the mediation of currents created by the ciliated epithelium of the fimbriae, its propulsion through the tube either by ciliated currents, by peristaltic movements of the tubal walls, or by both forces acting conjointly; while in the uterine cavity the descent of the ovum is impeded by the upward current produced by the ciliated epithelium of the uterine

[1] Mr. Tait, in his recent work on Ectopic Pregnancy, refers to a specimen described by Dr. Walter as one of primary ovarian pregnancy (sac had ruptured at fifth month and foetus had escaped into peritoneal cavity), which is now in the Dorpat museum, and suggests a careful investigation as to its real character. At Werth's request this has since been made by Runge, with a complete confirmation of the significance given to it by Walter in his original publication. Werth, l. c., p. 64.

[2] Paltauf. Arch. f. Gynaek. Vol. xxx, p. 456.

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mucosa. This latter force undoubtedly helps propel the spermatozoa in the direction of the fundus or the cornua. How far the spermatozoa are hindered from entering the tubes by the opposing current is a matter of uncertainty. That it does not necessarily prevent progression is shown by the fact that in certain animals the entire current is in an outward direction. Wyder,[1] moreover, reports a case of tubal pregnancy in which he found in the uterine portion of the tube ciliated epithelium everywhere present.

As exceptions to the ordinary mechanism, it is possible for an ovum to migrate from the ovary upon one side across the pelvis, and enter the tube upon the opposite side; or possibly, in very rare instances, after entering the uterine cavity, to cross the fundus and find lodgment in the opposite dilated tube.[2]

In regard to the aetiology of tubal pregnancy, Mr. Tait is unquestionably right in insisting upon the importance of the various forms of chronic salpingitis. Owing to the associated loss of epithelium, the dilatation and other changes in the tube walls, the two active forces which propel the ovum through the tube, viz., ciliary movements and peristalsis, are weakened or destroyed, while free ingress is afforded to the spermatozoa. Or, again, the passage of the ovum may be interfered with by the secondary results of catarrhal inflammations, such as the production of mucous polypi, of adhesions, or of sac-like dilatations. Formerly great stress was laid upon the aetiological importance of flexions and constrictions resulting from old peritoneal adhesions and inflammatory bands. Curiously enough, in recent laparotomies for tubal rupture, this cause has not played an important part. It is not quite clear whether the peritonitis, formerly observed so frequently at autopsies, is not in most instances secondary. It is, moreover, possible that as a class, in cases where ante-

[1] Wyder, Beiträge zur Lehre von der Extrauterinschwangerschaft, etc. Arch. f. Gynaek. Vol. xxviii, p. 381.

[2] In a review by Schaeffer (Arch. f. Gynaek., vol. xvii, p. 13) the question of the internal migration of the ovum is once more placed in doubt. In addition to the inherent improbability of the occurrence, Schaeffer declares that in all the cases reported the evidence is open to criticism.

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cedent peritonitis has existed as a cause, the haemorrhages resulting from rupture, owing to the agglutination of intestines and pelvic organs, are circumscribed, and do not call for surgical measures of relief.

Recent observations have shown that there is a tendency of tubal pregnancy to recur. Thus, Hermann has reported a case where in performing laparotomy for tubal rupture he found the remains of an ovum in the other tube. Tait[1] has reported one and Veit[2] three cases where, within a year or two after a first operation for tubal rupture, a second laparotomy was rendered necessary because of the occurrence of pregnancy in the tube of the opposite side.

Tubal pregnancy is associated with the formation of a uterine decidua, which differs in no wise from the decidua of pregnancy, except that the distinction into three layers is less marked. The decidua of the tube containing the fecundated ovum possesses a cell layer alone, as the tubal mucosa contains few if any glands. There is no serotina, nor is there any maternal portion to the placenta. The club-shaped extremities of the villi are simply imbedded in the muscular walls. Concerning the decidua reflexa, opinions are conflicting. Frommel and Winckel maintain its existence. None was discovered by Langhans and Leopold.

In the early months, the development of the ovum leads to a spindle-shaped dilatation of the tube, associated with hypertrophy of the muscular walls, due to increase in the length and thickness of the individual fibres. As regards the degree of hypertrophy, very great individual variations have been observed. Indeed, in the same sac a thickening at one point may be accompanied by an excessive degree of tenuity, due to over-distension at another. Now the ultimate fate of a tubal pregnancy is in large measure dependent upon these anatomical differences. Unquestionably early rupture, such as occurred in my two cases, is the rule. Mr. Tait says,—"Out of an enormous number of specimens which I have

[1] Tait, British Gynaecological Journal, Aug., 1888, p. 178.

[2] Veit, Gesellsch. f. Geburtohülfe und Gynaek, zu Berlin, May 10, 1889.

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examined, I have entirely failed to satisfy myself that rupture has been delayed later than the twelfth week." It seems to me, however, carrying scepticism too far to refuse credence to the positive observations of others, made apparently with the utmost care and with full knowledge of possible sources of error, which seem to show that a tubal pregnancy may exceptionally reach advanced, or even the full, term of pregnancy. At present it seems fair to assume that when the sac which surrounds the ovum is composed of muscular and connective-tissue fibres, with an external peritoneal envelope, and directly communicates with the Fallopian tube, the sac walls are of tubal origin. Of course it is not possible to assert that no rupture has taken place in the course of development. It is only known positively that rupture occurring at the site of placental attachment gives rise to haemorrhage fatal to the foetus; and the same is true, with rare exceptions, where rupture occurs at any point of the peritoneal surface. That rupture has first occurred into the cavity of the broad ligament in all the cases which go on to the period of viability does not seem so absolutely certain. The anatomical appearances, in some instances at least, indicate that the exposure of the foetal membranes here and there through the maternal sac results not so much from laceration as from the gradual separation of the muscular fibres, due to excessive stretching.[1] In most of the cases in which the pregnancy reaches an advanced stage, the development of the tube takes place principally between the folds of the broad ligament. The support furnished the tubal sac by the gradual unfolding of the layers of the ligament hinders rupture. More rarely pregnancy may go to the period of viability without encroaching upon the intra-ligamentous space. The tumor then rises above the pelvic brim, and is furnished with a species of pedicle consisting of the uterine end of the tube and of the broad ligament.

The first of the above, or the intra-ligamentous form, lies

[1] *Vide* Tables of Werth, Beitrage zur Anatomie und zur Operativen Behandlung der Extrauterinschwangerschaft.

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close to the uterus, which it not infrequently crowds upwards and forwards. The uterine end of the tube varies greatly in length. The fimbriated extremity is unrecognisable. Usually no traces of the ovary are found.

In the so-called pedicled form, the uterus is crowded to one side, or retroverted. The uterine end of the tube is usually long and thickened. The corresponding ovary has generally been discovered. In both cases the relations of the sac are often obscured by adhesions to adjacent viscera. In the second half of pregnancy, rupture of the sac and the escape of the foetus into the peritoneal cavity may occur without noticeable haemorrhage, or without interruption of pregnancy. As the pressure is removed by the escape of the amniotic fluid, the placental borders curl inward so as to furnish a cup-like space, while the membranes sink downward and cover the upper placental surface. The foetus in these cases may occupy the abdominal cavity, or a sac may be formed by the agglutination of the adjacent viscera.

Werth has reported a case in which death of the embryo occurred in the second month, and was followed by haemorrhage, which poured through the abdominal end of the tube into the pelvic cavity, and gave rise to intra-peritoneal haematocele. Similar observations were made by Veit and Westermark. This form Werth terms tubal abortion. In another case, described by Wyder, the fimbriated extremity of the tube was obliterated, and as a consequence the haemorrhage following the separation of the ovum converted the ampulla of the tube into a blood cyst the size of the fist.[1]

In the interstitial form of pregnancy, *i. e.*, where the ovum develops in the uterine portion of the tube, the sac of the ovum forms a whole with the body of the uterus. Of twenty-six such cases collected by Hecker, all ruptured before the sixth month, Tait says, that "so far as known, interstitial pregnancy is uniformly fatal by primary intra-peritoneal rupture before the fifth month." Schwarz,[2] however, reports a

[1] Werth, Beiträge zur Anatomie, etc., der Extrauterinschwangerschaft, pp. 105, 106.

[2] Schwarz, Wiener Med. Blätter, 1886. In the abstract furnished by Grandin in Munde's Jour. (January, 1887, p. 101), the date of pregnancy is not given.

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case belonging in this category in which the foetus was expelled into the uterine cavity. The patient was known to be pregnant. Repeated haemorrhages indicated a threatened abortion. To avoid further dangers, the cervix was dilated with the view to empty the uterus. On examination with the finger the uterine cavity was found empty, but at the uterine opening of the left tube was a piece of membrane, which was removed. The next day the finger detected membrane at the same site, and beyond a hard body. The uterus began to contract energetically. On the fifth day a foetus was passed by the vagina, the pains ceased, the tumor largely disappeared, and the patient made a good convalescence.

Martin removed a male foetus, thirty-three centimeters long (six months), from the left uterine cornu. The patient recovered. Duvelius, who examined the specimen, concluded that the ovum had partially grown into the tube, and between the folds of the broad ligament. He thought that rupture did not occur owing to the number of the muscular elements in the sac wall.[1]

The burning question at this moment connected with tubal pregnancy is that of early diagnosis. Dr. Hanks has recently stated his belief that a diagnosis can be made in ninety-five per cent. of the cases we are called upon to attend. Mr. Tait, on the other hand, thinks "he may be excused for maintaining a somewhat sceptical attitude concerning the correctness of the diagnosis of these gentlemen who speak of making a certain diagnosis before the period of rupture."

The problem seems simple enough. Given pregnancy, and having ascertained that the ovum is not in the uterus, the diagnosis is effected. But we all know that the subjective symptoms of pregnancy are deceptive, and that the pigmentation, the mammary, and the utero-vaginal changes are not always so clearly defined in the first three months as to make it safe in every case to positively diagnosticate pregnancy in even the intra-uterine form. The advice to use the sound to demonstrate the vacuity of the uterus in suspected

[1] Martin, Zeitschr. f. Geb. und Gynaek. Vol. xi, p. 416.

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cases has been the cause of many needless abortions. Fortunately, the sound often does no other harm than to add to our sources of error. Twice within the year past gravid patients have been sent to me with the assurance that the repeated introduction of the sound had shown the empty condition of the womb. In one of them, after an anaesthetic was given, it was easy to determine the presence of the head of the child through the cervix at the internal os; in the other, I felt perplexed, and asked the opinion of Dr. Thomas. He pronounced it an ordinary pregnancy, and the event has shown that he was correct. Twice within the year, to my knowledge, the abdomen has been opened in this city for supposed extra-uterine gestation, and only ordinary gravidity has been found.

In the main, our dependence must be upon local symptoms and local changes. The former consist of the suspension of the menses, often followed after a brief period by bloody discharge, of paroxysmal pains, and of the discharge of the decidua. But the latter is by no means of constant occurrence. Paroxysmal pains are frequent in other forms of tubal disease, and menstrual disturbances are common phenomena in uterine derangements. In my two cases, and in most of the forty-two reported by Mr. Tait, there was no call for a diagnosis until rupture had taken place. As a matter of fact, the occasion for diagnosis must be very exceptional in the large class in which rupture occurs primarily within the peritoneal cavity. In the intra-ligamentous form the case is somewhat different. Here the swelling to the side of the uterus is easily reached through the vagina. We have, as distinctive signs, a rapidly growing tumor, early fluctuation, and the presence of pulsating vessels over the site of the tumor. Bi-manual examination under an anaesthetic, especially if the thumb be introduced into the vagina and two fingers into the rectum, makes it possible to determine that the tumor is independent of the uterus. I believe in such cases that the chances of error are slight. Of course the diagnosis is strengthened by the existence of concom-

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itant symptoms. I do not understand Mr. Tait to deny the possibilities of a diagnosis under such conditions. He differs only in regarding all intra-ligamentous cases as secondary to tubal rupture.

Not much dependence is to be placed upon uterine changes in the early months. These sometimes correspond to those of ordinary utero-gestation, but in the instances I have related in this paper they were insignificant. Neither perceptible enlargement nor cervical softening indicated pregnancy.

After the third month it is not ordinarily difficult to determine the existence of the pregnant state. Ballottement is usually perceptible at an early date, and the foetal heart makes the diagnosis certain; but the greatest care needs to be exercised in the examination of the patient, and in the formation of an opinion concerning the extra-uterine situation of the ovum. In a suspected case, violence in the attempt to separate the tumor from the uterus may cause rupture of the sac. Grandin believes the absence of contractions when frictions are applied to the sac of an extra-uterine ovum should prove a most valuable aid to diagnosis. Küstner,[1] curiously enough, maintains that the existence of contractions in tubal pregnancy should distinguish them from other pelvic growths. Evidently here more clinical observations are called for. Mr. Tait cites as a misleading condition an abnormal thinness of the uterine walls. In my own experience, lateral flexion of the uterus often simulates ectopic gestation to a surprising degree. In these cases the fundus containing the ovum lies upon one side of the pelvis. The cervix is crowded to the opposite side. Between the two a deep sulcus is felt. If the patient is hysterical, these deranged relations are exaggerated by contraction of the abdominal muscles. No difficulty in detecting the error is experienced when the patient is completely anaesthetised. Cases of retroflexion of the gravid uterus, with incarceration, are likewise often difficult to distinguish from extra-uterine pregnancy.

[1] Müller's Handbuch der Geburtshülfe. Vol. xi, part 2, p. 541.

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The distinction by physical signs between the tubal, the ovarian, and the secondary abdominal form is scarcely practicable so long as trained anatomists fail to agree concerning them when the abdomen has been opened and the organs are exposed to view.

A review of the subject of diagnosis makes it apparent that many cases of ectopic pregnancy present no symptoms previous to rupture. In another class, the existence of a suspicious tumor, with few or none of the corroborative signs, should lead to a waiting policy, or, when the symptoms are of a threatening character, to an explorative laparotomy. It is well, however, to remember, that with reference to this latter procedure recent popular interest in abdominal surgery has a tendency to invest trifling anomalies occurring in gestation with a sinister importance. But there still remains a considerable class of cases where the early diagnosis is scarcely doubtful, as, for instance, that of Hawley,[1] where the diagnosis made previous to rupture was confirmed by laparotomy.

Upon the fact that in favorable cases certainty of diagnosis is attainable in the early stages of ectopic pregnancy rests the entire argument as to the validity of the treatment by means of galvanism or the Faradaic current.

In two cases, which I have elsewhere offered in evidence, there were present the early signs of pregnancy, a rapidly growing tumor to the side of the uterus, pulsating vessels, paroxysmal pains, and, in one case, discharge of the decidua. In both instances the diagnosis was confirmed by Dr. Thomas, concerning whose cool judgment and great experience there can be no question. In both the Faradaic current was used—the positive pole externally, the negative pole through the vagina for five minutes, and then through the rectum for the same period. This treatment was employed twice daily. After a couple of days the tumor had become noticeably flaccid, and in a week had shrunken to a small size. I have seen both patients many times since. Neither has suffered

[1] Hawley, N. Y. Med. Jour., June 16, 1888.

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inconvenience, though in each a body of the size of an English walnut may still be felt. One has since given birth to two children without trouble ensuing.

These cases are typical, and many similar ones have been reported. The same treatment employed in the forms of tubal distension due to salpingitis has not, in my experience, proved of avail. The use of the galvanic or Faradaic current does not call for special skill. The only argument against the method, except that the results reported carry with them the evidences of ignorance and folly, is that it is likely to cause rupture, and that the retained ovum is liable to excite suppuration. But these eventualities are so rare that they may be left in case of need to a subsequent laparotomy. It should be understood that the method under discussion is only available in the first three months, and that no one in this country, as is commonly assumed by foreign critics, advocates electro-puncture. Foreign critics state that the results we claim are impossible. But it is unscientific to condemn them without subjecting the method to experimental tests.

The argument in favor of the early use of galvanism does not in the slightest degree impair the value of laparotomy, which must always remain our most important therapeutical resource. Only seven years ago I wrote as follows:

As, under careful management, rupture of the tube most often proves fatal, Kiwisch recommended in such cases to make an incision four or five inches in length through the abdominal wall along the linea alba. In order to be sure that internal haemorrhage had really taken place, he advised, when the peritonaeum was reached, to first make a small puncture, and to introduce a pipette into the abdominal cavity. If the presence of blood was detected, the peritonaeum should then be laid open the length of the abdominal wound, and, after first tying the bleeding vessels, the sac should be removed, and the peritonaeum carefully cleansed. Strange to say, intelligent as these instructions seem, no one in these days of abdominal surgery has so far had the hardihood to carry them into execution. The reasons for this backwardness are probably to be found in the uncertainties of the diagnosis, the risk of finding the sac hopelessly matted to the adjacent viscera, the dislike for operating upon a dying woman, and the fact that a considerable number of

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spontaneous recoveries occur, either from the mummification of the foetus, or by the limitation of the sanguineous effusion and the production of a circumscribed haematocele.

The glory of demonstrating the practicability of the surgical treatment of rupture belongs to Mr. Tait. The sentence I have quoted was hardly printed before he began that magnificent series of operations,—according to recent reports, forty-two cases with but two deaths,—which is certainly one of the greatest surgical achievements of the last ten years. Many active workers are now following in his footsteps, and the future saving of life by the employment of laparotomy in this field will be to him an eternal monument of fame.

Laparotomy not only possesses the advantage of being the one measure for the treatment of cases where, as in rupture, death is the common alternative, but it enriches our resources in cases of impending danger. Unlike the employment of galvanism, it presupposes the equipment necessary for laparotomy and the skill that comes from experience. It possesses this advantage; it leaves nothing to chance. All the possibilities are under the control of human intelligence. Except for the question of ethics, it is available before and after rupture. It can be resorted to for the extirpation of the sac after three months have passed, when galvanism is no longer available. But Mr. Tait maintains that we have no right of our own volition to sacrifice foetal life. That depends. So long as the attempt to remove the foetus after the period of viability was followed by a ghastly record of maternal deaths, it was necessary to recognise the limitations of our skill, and seek to preserve the life of the greatest value. Recent more hopeful experiences challenge us to a revision of older views. Thus, in addition to the memorable case of Jessop, which formerly stood alone in saving the life of both mother and child, we have now those of Martin,[1] Lazarewicz,[2] Olshausen,[3] Breisky,[4] Braun von Fern-

[1] Martin. Berliner Klin. Woch., 1881, p. 775.

[2] Lazarewicz. Repertoire Universel des Nouvelles Arch. d'Obstétrique et de Gynécol., July 28, 1886.

[3] Olshausen. Berliner Gesellsch., für Geb. und Gynaek. November 9, 1888.
Breisky. Wiener Med. Presse, 1887. No. 48.

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wald,[1] John Williams,[2] and Eastman,[3] of Indiana, in which the child was alive at the time of operation. In this list Williams alone left the sac *in situ*. Of the others, Olshausen, Breisky, and Eastman removed the sac entire with the placenta. The others controlled haemorrhage by means of ligatures, and brought a portion of the sac outside the abdominal wound.

These later results leave little reason to doubt that, when the anatomical conditions come to be properly realized, human invention will find means to control the dangers of the so called primary operation for extra-uterine pregnancy, and it, too, will find its place in the domain of legitimate surgery.

DISCUSSION.

WILLIAM GOODELL, M. D., of Pennsylvania, said that he had listened with great pleasure to the paper, and that it left little open for discussion. With reference to the causation of extra-uterine foetation, he did not think the views expressed in the paper, although the most plausible, could be unconditionally accepted. Dr. Goodell knew of fibroid tumors which appeared to be the causes of extra-uterine foetation, possibly through the agency of adhesions. The fact that a woman will have a first labour followed by a period of prolonged sterility, and then show a liability to extra-uterine pregnancy, pointed, in his opinion, to some traumatism at the first labour, which, perhaps, caused adhesions.

He thought extra-uterine pregnancy much more frequent than the profession seemed to regard it. Dr. Formad, one of the two coroners' physicians of Philadelphia, had specimens from nineteen cases of extra-uterine pregnancy in which he made *post-mortem* examinations to determine the cause of death—nineteen cases not recognised by the physicians attending them. If to these are added the number of cases correctly diagnosticated and those where a wrong diagnosis remains uncorrected, the total assumes large proportions.

His views of the pathology of the condition harmonized with those expressed by Dr. Lusk. The intra-ligamentous forms, he thought, were tubal at first. It had occurred to him, that if an ovum or Graffian follicle could travel from one ovary to the Fallopian tube of the opposite

[1] Braun von Fernwald. Sitzungsberichte, 1889. No. 5.
[2] John Williams. Obst. Trans, 1887, p. 482.
[3] Eastman. Am. Jour. Obst., Sept., 1888.

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side, it might be possible for a fecundated ovum to fall into the abdominal cavity and find lodgment there. The progress of an intra-ligamentous pregnancy was similar to that of an intra-ligamentous ovarian cyst. It might penetrate between the two layers of peritonaeum, stripping the latter from the uterus and bladder or the pelvic wall, or it might penetrate into the meso-colon or meso-coecum. After its removal, faecal fistula might result.

The placenta is always larger in extra-uterine pregnancy than in intra-uterine, because the amount of blood supplied to a given extra-uterine area is less.

Dr. Goodell said that, in his experience, which had been considerable, the clinical history of these cases was about as follows: There is, first, the usual suppression of the menses, which lasts for from two weeks to two months, and is then followed by an irregular menstruation, a metrorrhagia sometimes free, sometimes slight. Colicky pains are experienced. These three symptoms combined should always arouse a suspicion of extra-uterine pregnancy. The pain may precede the haemorrhage, but usually follows it. It may be severe, or slight. Other signs of pregnancy, such as nausea and milk in the breast, may or may not be present. In normal pregnancy there is, in the early weeks, frequent micturition, especially at night. In extra-uterine pregnancy this symptom is exaggerated. But all these symptoms may be absent, and the physical signs must be our main dependence in arriving at a diagnosis. Dr. Goodell had made the diagnosis before operating only once, but believed it to be usually possible, if a physical examination were made. Is it necessary, however, to make a positive diagnosis before operating? If the patient has colicky pains, and suffers from acute anaemia and great pelvic distress,—if her general health is affected, and there be a tumor at one side of the uterus,—a physician is warranted in operating, even though the case may not prove one of extra-uterine pregnancy.

The speaker agreed with Dr. Lusk, that aspiration must be discarded as a method of treatment. He thought that he had lost a case through aspirating a foetal sac. The mortality attending that treatment had been very large. He cited cases reported by Hicks, Barbier, Perrier, and others, in which death had closely followed aspiration of the sac. With regard to the treatment by injection of morphine, he was surprised that it had proved effectual in so many cases, the apparent slight risk to life, and the frequency with which the foetus was destroyed. Notwithstanding, he would not feel himself justified in resorting to it. His opinion of the electrical treatment differed from that of Dr. Lusk, because he thought the proper treatment, where the diagnosis was confident, was removal with the knife. If electricity be employed to destroy the foetus, a laparotomy often becomes necessary later, because of adhesions, etc. There are two cases, however, in which electricity may be employed,—first,

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when an operation is declined, and, second, when the physician is not skilled in performing laparotomy. In any case, the tumor should not be penetrated by needles: where that has been done the result has always been fatal.

Dr. Goodell thought laparotomy the best treatment before rupture of the sac had taken place, and the only proper treatment after rupture. He thought the problem a puzzling one after the child had become viable. His plan of action then would be either to remove the whole sac, or to deliver the child and sew the edges of the sac to the abdominal wound, providing ample drainage. He mentioned the fact that Mr. Tait, after disinfecting the sac, closed it.

He said he had had a case of twin pregnancy,—one intra-uterine, and one extra-uterine. He thought in such cases most physicians would prefer resorting to the Porro operation.

Dr. Goodell then gave short accounts of a number of cases that had come within his experience. The first case he had seen was the one which formed the text of Dr. Parry's now classic book on the subject. The case had been diagnosed as cellulitis and pelvic peritonitis, and it was not for some time that a correct diagnosis was reached. An operation was refused, and the patient died. A *post-mortem* examination confirmed the diagnosis.

The next case presented no difficulties. There were evidences of pregnancy, and there was metrorrhagia. The uterus was empty. An operation was refused, and the patient died.

The third case had been pregnant seven months. The diagnosis presented no difficulties. The uterus was empty, and at the right side there was an abdominal tumor emitting foetal heart-sounds. An incision was made directly over the tumor, which had so dissected up the peritonæum that the operation was wholly extra-peritoneal. It was before the days of antisepsis, and the patient died of pyæmia.

In a fourth case the diagnosis was clear, but the patient died before an operation could be arranged for.

A fifth case presented a novel source of perplexity, in that the abdominal tumor was resonant on percussion. A decomposed foetus was removed.

A sixth case had advanced to the seventh month. The foetus was removed through an incision over the tumor, and the patient did well until the eleventh day after the operation, when she died in uraemic convulsions.

A seventh case was one of twin conception. The woman was dying when the diagnosis was made, and at the *post-mortem* examination an intra-uterine and an extra-uterine foetus were found.

In the next three cases cited there was no difficulty in the diagnosis. In two of them pulsating extra-uterine tumors were discovered; in the

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third there were symptoms of acute anaemia following rupture of the sac. Successful operations were performed in all three.

The last case mentioned was one in which the foetus had died in consequence of a blow on the mother's abdomen, occasioned by a fall. Some time afterwards the putrid remains of the foetus were removed from a cavity at one side of the uterus. Following this removal the woman had pyaemia, from which she recovered.

Dr. Henry O. Marcy, of Massachusetts, spoke of two cases, which he had followed clinically from the beginning, of abdominal pregnancy. The first was a young woman, who, after five years of married life without pregnancy, showed certain evidences of pregnancy; but the uterus, though enlarged, was empty and movable. Nothing abnormal was noticed at either side of the pelvic basin. No positive diagnosis was made. After four months her life was evidently endangered by intestinal obstruction. He had advised making an exploratory laparotomy, but the other consultants overruled him. The patient died, and an autopsy revealed an abdominal pregnancy four inches in length. Both tubes were normal.

The second case had been sterile for a number of years; obscure abdominal symptoms then set in. The uterus was enlarged and movable, but both it and the tubes appeared to be normal. She died suddenly after a short period of collapse. The autopsy showed abdominal pregnancy, the foetus in this, as in the preceding case, being situated quite above the pelvic brim. It was attached to the surrounding intestines, and there was a placenta of considerable size which had ruptured. In neither of these cases was there any indication of disease of the uterus, ovaries, or tubes.

Dr. Marcy said that both these cases led him to think that the abdominal pregnancy found was such primarily, contrary to the views of Mr. Tait and the gentlemen who had preceded him. He did not think that an ovum which had begun its development in the tubes would be dislodged and find attachment elsewhere.

He had never used electricity in cases of abdominal pregnancy.

He thought the general practitioner should learn to recognise the condition early, and be prepared for prompt and efficient action, and cited a case presenting no operative difficulties, in which a short delay had wasted an opportunity to save a life.

Dr. J. E. Janvrin, of New York, said that he agreed fully with nearly all of the opinions expressed by Dr. Lusk and Dr. Goodell, and that he could add very little to the discussion. He thought the colicky pains, which formed a part of the clinical history of nearly every case reported, had their origin in small haemorrhages beneath the peritonaeum. A case had been reported, in Kentucky, in which the autopsy revealed several

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layers of clotted blood, of different ages, upon the tube, showing that a number of haemorrhages had taken place at intervals.

He emphasized the importance of operating instead of using electrical means of treatment, and believed an operation justifiable where there was reasonable ground for thinking extra-uterine pregnancy existed.

DR. GOODELL said that in his three cases in which there were living children, the foetal tumor had given no evidence of contractility, and asked Dr. Lusk how, if there were no muscular fibres in the sac, there could be any such contractions as were described by a German writer.

DR. LUSK replied that in tubal pregnancy muscular fibres were derived from the tube and from the folds of the broad ligament, and that when subjected to friction those fibres contracted. In many cases there was an abundance of muscular fibres.

He said he wished to correct a misunderstanding of his statements regarding the migration of the ovum. He had not said that external migration of the ovum was a rare occurrence. It had been claimed that the ovum could cross from one side of the pelvis to the other, enter the opposite tube, pass into the uterus, cross the cavity of the latter, and enter the other tube. It was this internal migration that had been questioned. Where the ovum had been found in a tube, the distal end of which was closed, it had been supposed that the ovum had entered from the uterine cavity.

He said he had left the question of treatment by puncture undiscussed. He hoped no one would resort to such a procedure. He had done it in only one case, where the tumor was thought to be a recent haematocele. Subsequently the tumor sloughed; and, although she recovered, the patient was in a very grave condition for many hours.

With reference to the question, Why not laparotomy at once? he said that *provided* the physician were thoroughly equipped, *provided* he had had the requisite experience, there need be no hesitation to perform laparotomy in the early stage of a suspected case of tubal pregnancy. There was no more danger than in an operation for removal of the tube. The early operations, made with few instruments, few assistants, and no trained nurses, had not yielded very good results. He regretted to say that he thought a good hospital and trained assistants and nurses requisite for success. Galvanism could be used with relative safety; and the case being diagnosed, the foetus could be destroyed, before the third month, by means of electricity, and, as a rule, give no farther trouble. A practitioner who is removed from facilities for performing laparotomy could resort to electricity. He had not desired to compare the two methods of treatment, but regarded the latter as complementary to the former.

He did not agree with Dr. Janvrin that the colicky pains were asso-

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ciated with rupture. He had notes of cases in which colicky pains were present, and the tubes after removal showed no signs of rupture.

Dr. Henry F. Risch, af New York county, said he thought that in cases of intra-abdominal haemorrhage, where preëxisting ascetes could be excluded, the amount of effused blood could be estimated by percussion. He had had a case in which percussion revealed the fact that the abdomen was half full of blood.

Dr. Janvrin said that Dr. Lusk had misunderstood him; that he had not intended to say that the colicky pains were *always* due to haemorrhage. They might be occasioned by the rapid distension of the tube by the growing foetus.

Dr. Lusk said that colicky pains had been observed in cases of tubal distension from any cause.

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PARTIAL INVERSION OF THE UTERUS.

By GEORGE E. FELL, M. D., of Erie county.

This case is briefly reported to indicate the treatment which proved efficacious.

Mrs. W——, multipara. I attended her during an ordinary although somewhat protracted confinement, and delivered her at six P. M.; placenta removed without difficulty. The uterus was irrigated, and the patient left in a comfortable condition. Supra pubic palpation indicated a contracted womb, with a slight depression on one side; not that rotundity of outline ordinarily felt. At eleven P. M. the patient was comfortable; no abnormal condition, but after-pains severe at times. I was hurriedly called at two A. M. The patient was in a high fever, anxious, and experiencing great pain in the pelvic region, almost a condition of collapse. The uterus could not be detected above the pubic arch. Vaginal examination revealed the fundus low down in the vagina, and almost protruding.

The patient was put in the latero-dorsal position (not Simm's position), as for uterine irrigation. A large rubber irrigating tube, attached to a syringe, was introduced, and a stream of quite hot water thrown through the tube upon the fundus, and a slight, steady pressure kept up. The fundus moved slowly upward, and, after passing the os, went rapidly into position. The sudden improvement in the condition of the patient gave evidence of the return to the normal state. The tube was held in position for a short time, the patient quieted with hypodermic injections of morphia, and there was no return of the trouble.

Subsequent inquiry elicited the fact that in the labour preceding the one described forceps had been used, and the

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womb forcibly inverted so as to appear externally. It had been replaced without much trouble, and the patient made a tedious recovery.

DISCUSSION.

Dr. Henry D. Marcy, of Massachusetts, said that at a society meeting, a short time before, about ten cases of partial rapid inversion of the uterus, readily reducible without injury to the patient, had been reported. This led him to believe the accident much more frequent than the text-books would lead one to suppose.

He thought that the causes of inversion of the uterus were very obscure, and did not recall any instance in which they could be traced to a previous delivery.

The treatment by irrigation impressed him very favorably.

He requested Dr. Fell to describe the position of the depression in the uterine fundus, and the appearance of the os.

In response, Dr. Fell said that the depression was at the left corner of the uterus, and that he did not notice anything peculiar about the os after the return of the uterus to its normal position.

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THE LATERO-DORSAL POSITION IN GYNAECIC IRRIGATION.

By George E. Fell, M. D., of Erie county.

At the meeting of the Buffalo Obstetrical Club, held during the winter of 1889, a series of questions was propounded by the writer to the members of the club on the relation of posture to treatment in obstetrics and gynaecology. These questions were as follows: What position do you find most convenient in labour?—in ordinary gynaecological operations?—in examination of the uterus?—for cleansing the uterine cavity, or in the use of the douche or irrigator?

On all the questions except the last a general uniformity of opinion prevailed as to the positions best suited for the different purposes mentioned.

In gynaecic irrigation two methods were generally used, viz., dorsal decubitus, with bed-pan return current tube, according to the many well known methods; or dorsal decubitus, with limbs resting on one or two chairs placed in front of the couch or bed, the collecting vessel being placed on the floor between the chairs. Both of these methods offer great inconvenience to the practitioner or nurse, whereas the method I have now used for nearly two years I can fully recommend. In fact, I have used it so frequently that I am prepared to meet any objection that may be urged against it:

In obstetrical practice at the present time irrigation of the uterus is so frequently required that a simple and efficacious means of performing it alone with the patient is a desideratum of no inconsiderable importance. I have every reason to believe that the method I advocate has not been used to any extent, as no record of its use appears in our most prominent text-books. In the Buffalo Obstetrical Club none of the members had used it before I had described it; at least,

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their answers to a series of questions upon the subject of Posture in Relation to Treatment gave no indication that they had.

An ordinary table, sofa, or bed may be used, the right side covered with waterproof or oil-cloth arranged in folds to carry the return fluid from the patient into preferably a large, open wash-bowl, such as may be found in every house. The patient is then placed upon the oil-cloth, with her buttocks projecting over the edge of the bed, she, of course, lying on her left side. The limbs are drawn up, and the body lies at an angle of about forty degrees with the side of the bed. In this position, virtually Simm's, the speculum may be introduced, and an intra-uterine irrigating tube, attached to a syringe and freed from air, passed beyond the os or up to the fundus, as the case may require. If we were now to begin our lavement, about all the return flow would pass between the thighs into the bed. To obviate this, it will be necessary to prop the two knees up with pillows, when all the return flow will pass downward, over the gluteal region, along the folds of the oilcloth, into the bowl or receptacle provided for it. The position of the physician or nurse, sitting on a chair at the side of the bed, with the knee against the buttocks of the patient, effectually prevents her from sliding from the bed.

During the operation there need be but little exposure of the person of the patient. The position is not as uncomfortable or offensive to her as in those methods ordinarily used for this purpose; and to the operator, be he physician or nurse, it is much easier.

Furthermore, it can almost as readily be applied to a woman weighing two hundred as to one weighing one hundred pounds, and, I must say again, with so much less objection and trouble that it will prove a boon to those who accustom themselves to use it.

Important points to be remembered are, that the knees of the patient must be raised sufficiently high with a pillow or folded quilt to have the inner thigh of the left limb slope

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toward the right side of the bed; and that the body or buttocks must project slightly over the edge of the bed so that the outflow passing over the gluteal region will readily fall into the folds of the waterproof or oil-cloth, and be carried into the receptacle provided.

Frequently I have used one or two gallons of fluid in a lavement in puerperal septicaemia, and the result has been uniformly most satisfactory.

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REPORT OF A CASE OF LAPAROTOMY FOR RUPTURED PYOSALPINX: ERROR IN DIAGNOSIS; RECOVERY.

By C. S. Wood, M. D., of New York County.

A duty we owe to the profession as well as to ourselves, and the only way in which statistics can be made of any value, is to report our cases of errors in diagnosis as well as our unsuccessful cases.

During the past decade, or since antisepsis has become an established principle, no greater strides in surgery have been made than in the special department of abdominal surgery, and, in consequence, many valuable lives are saved annually.

An ovarian tumor, which we formerly treated only by paracentesis, repeating the operation as often as the sac became filled, until the woman died of exhaustion, is now treated by laparotomy, the sac removed, and the operation results in almost uniform success, thanks to Sir Joseph Lister. But, owing to the brilliant successes attained by this operation, and the desire on the part of most of our young men to have their names emblazoned on the tablets of fame, there can be no doubt, in the minds of conservative men, that the operation is often performed when uncalled for, and where it exposes the life of the patient to greater risks than the circumstances justify. This, I fear, is especially true of the operation of oophorectomy, by which so many women are unsexed without sufficient cause, and left in a worse condition than before. I have now several cases under my care which fully corroborate this statement. Time, the great arbiter, will sooner or later regulate this matter; but, in the meantime, should not we, as physicians to whom the lives and happiness of our patients are entrusted, raise our voices in protest against this too frequent sacrifice of ovaries?

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The diagnosis of diseases of the abdominal cavity is, perhaps, more difficult than that of those of any other part of the body, and often absolutely impossible without an exploratory incision; but is there need, after so doing, to remove the ovaries, when not diseased, as though they were the only offending organs, because, forsooth, nothing else is found? Do we consider how often the diseases, which point by their symptoms to those organs, have been in the past and will be in the future cured by therapeutic and hygienic measures alone, without leaving such wrecks as we now so frequently see where ovariectomy has been performed without affording any relief?

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With these introductory remarks, I will now briefly report a case in which an error in diagnosis occurred, but which, nevertheless, not only made an operation justifiable, but an imperative necessity.

PERITONITIS LAPAROTOMY—RECOVERY.—Miss M. M., single, aged 28, parentage unknown, had experienced previous good health, except for an occasional attack of colicky pain in the lower front of the abdomen, lasting a few days, with more or less fever, and then passing off under simple treatment. One year since, being in a somewhat debilitated condition, she was advised by me to spend a couple of months at Saratoga, which she did, and returned in the fall in excellent health, and more fleshy than I had ever seen her before. On May 9, 1889, I was called to see her on account of slight fever, with an uneasy sensation in the right iliac fossa, slight tympanites, anorexia, etc. Considering the case one of gastric disturbance depending upon constipation, a cathartic was ordered with a simple febrile mixture. On the following day I found that the bowels had moved freely, yet the tympanites still persisted, and the pain was greater, radiating from the iliac region to the umbilicus. The abdomen was tender on pressure all over the lower part, but more than elsewhere over the appendix, where an indistinct, deep-seated hardness could be made out. Pulse and temperature 100.

From this time forward the symptoms were closely watched, and each day I felt more and more satisfied that she had a perityphlitic abscess in process of formation. Until the 18th, or nine days from the beginning of the attack, the temperature and pulse changed but little, the former occasionally rising to 101° or 101½°, while the latter varied from 100 to 120. There was constant thirst and loss of appetite. The tenderness remained about the same, but there was a gradual increase in

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the size of the swelling. Alternate hot and cold applications were made, as most agreeable to her.

At no time was the pain sufficiently severe to require more than a small dose of sulphate of morphine two or three times a day. There being no urgency, a careful examination was made twice a day, and I waited, expecting, as I have often seen similar cases recover by resolution, that the present one would result in the same happy manner; but in this I was doomed to disappointment.

On the morning of the 18th I was called in haste, the messenger saying he thought the patient was dying. Arriving at the house I found her sitting up in bed, with a woman on each side fanning her. A profuse perspiration covered her hands and face as well as the whole surface of the body. She was retching, her pulse very rapid and irregular, but her mind as clear as usual. After I had given her some stimulant and soothed her perturbation, she stated that she was as well as for the past few days when she went to sleep; that in the latter part of the night she was awakened by sickness of the stomach, followed by profuse vomiting of a propulsive character, like pumping water through a hose, as she expressed it, and that this was succeeded by a severe chill lasting an hour or more, notwithstanding the hot applications that had been made. The pain had all left her side, but was more severe higher up in the bowels.

As soon as I could get her in a prone position, the induration was carefully examined, and found to be very much smaller and softer. While making this examination, she partly turned on her side and vomited a watery fluid, ejecting it half across the room; and then, as before, insisted upon sitting up, as she felt that she could not get her breath while in a reclining position. Temperature, 103½°; pulse, 140.

Being satisfied that there was a rupture of a perityphlitic abscess into the peritoneal cavity, and that laparotomy was her only salvation, and being encouraged by the successful report of a similar case by Dr. Jacobus, I at once sent for Dr. W. Gill Wylie, who, with his brother, performed the operation on the forenoon of the same day. Ether was administered, and the usual antiseptic precautions observed. To the surprise of all of us, no perityphlitic abscess was found, and no tumor nor evidence of inflammation, except of a diffuse character over the whole pelvic peritonæum, as shown by an effusion of unorganized lymph covering a large surface and involving the omentum. Old inflammatory changes were evident in the thickened omentum and matted pelvic viscera. There was the ruptured sac of a pyosalpinx of the right side, which had been mistaken for a perityphlitic abscess both before and after the collapse occurred.

The sac with the ovary on that side was removed, and, on examining the ovary on the opposite side, cystic degeneration was found to exist to an extent sufficient to justify its removal, which was accomplished.

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The abdominal cavity was thoroughly irrigated with hot water, until it returned free from pus or blood. The usual dressings were made, a drainage-tube introduced, and the patient put to bed. Duration of operation, about one hour. She did well, and made an uninterrupted recovery in the course of four weeks, although for the first two weeks after the operation the temperature persisted at 101° to 102°, but more because of the old inflammatory thickening than the acute attack caused by the rupture.

This case may well illustrate the difficulties frequently encountered in the diagnosis of abdominal diseases. The patient had pain, with a swelling in the right iliac fossa, gradually increasing in size, fever, loss of appetite, thirst, and she complained of pain when the limb on that side was extended.

I have since learned that five or six years ago she had an abortion produced by some doctor; that she was quite sick for several weeks subsequent thereto, which fact would probably account for the old pelvic inflammation as well as the pyosalpinx, although she seemed to have suffered but little for several years prior to the present attack.

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THE MICROSCOPE IN DIAGNOSIS—PERSONAL OBSERVATIONS.

By GEORGE E. FELL, M. D., of Erie County.

While the microscope has revealed the intimate structure of tissues and illustrated the morphological changes producing pathological conditions, yet its usefulness in diagnosis is somewhat limited. To be sure, we may detect disease of the kidneys and genito-urinary tract by studying urinary deposits of tube-casts, pus corpuscles, salts, blood corpuscles, and epithelium. In examining foecal discharges important information may be obtained, as, also, in matter ejected from the stomach and lungs.

After adding the diagnosis of tumors, we have pretty fully indicated the power of the microscope to aid us in diagnosis.

Since the discovery of the bacillus tuberculosis by Koch, many have looked upon the microscope as a most important aid to the diagnosis of tuberculosis, and of great value in watching the progress of that malady. Its value even as a diagnostic aid in this disease is questioned by some good observers; and yet, my experience would lead me to think it of value. In evidence of this, I present a few cases in which the microscope appears to have been of marked value as an aid in diagnosis.

An interesting feature of some of these cases is, that physical examination in the hands of some of our most capable Fellows sometimes failed to detect a condition which the microscope revealed, confirmation of its results being furnished by the progress of the case.

The following letter from Dr. U. C. Lynde, a Fellow of this Society, details three of these cases:

BUFFALO, N. Y., July 20, 1889.

DEAR DOCTOR FELL: In the summer of 1884 I was attending two patients, male, about forty years of age. Both had night sweats, hectic

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fever, emaciation, rapid pulse, etc., and so similar were their symptoms, signs, and apparent condition that my prognosis was the same for both: unfavourable, my diagnosis being pulmonary tuberculosis.

Dr. Dawe, now of Rochester, this state, secured sputa from both patients. These sputa were carried to your office for microscopical examination, you having no knowledge whence they came. The sputum of A. D. M., of this city, was loaded with bacilli, while that of the other patient, W. W. P., had none in it. The former died inside of four months, while the latter recovered, and is now well.

In the summer of 1887 Dr. E. T. Dorland called me to see J. W., who had been sick for three months, when we sent you some of his sputum for examination for tubercle bacilli. His symptoms were, persistent cough, heavy expectoration, great emaciation (he had lost fifteen pounds in weight), hectic fever, night sweats, oedema of the feet, pulse at 140, and physical signs indicative of pulmonary tuberculosis. After two or three examinations you found no bacilli. Contrary to our expectations, the patient recovered, and is now well.

The following letter from Dr. A. E. Persons, Professor of Materia Medica and Therapeutics in the Medical Department of the Niagara University, reports another case:

G. P., aet. 18, student. Lived an a farm until two years ago. Father healthy; mother delicate, of a nervous temperament; brother and four sisters healthy; another brother died when ten years old of cerebro-spinal meningitis. The grandparents lived to exceed seventy-five years. One brother of the maternal grandmother was said to have died of phthisis.

From May to September, 1888, patient says he had occasional chilly sensations, and frequent attacks of headache. He felt well in July and August, his vacation, but had lost flesh on his return to the city, September 15. About October 1st he had an attack of acute pharyngitis accompanied by hoarseness. Temperature, when first taken, was 104°. He had a dry cough, anorexia, dry and mucous râles posteriorly over the right lung, expectoration streaked with blood. There were no signs of consolidation, and the diagnosis was catarrhal pneumonia. He was kept in bed two weeks, when the symptoms subsided, with exception of the cough, which persisted. He was allowed to sit up, but soon began to have chills and fever every afternoon. Dr. W. S. Tremaine was called in. A careful physical examination gave negative results. He advised quinine and increased nutrition, and improvement with cessation of the chills ensued. The temperature became nearly normal. The sputum was examined by Drs. Ewing and Banta, but no tubercle bacilli discovered. The patient was also examined by Dr. Dorr with the same result.

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Phthisis was suspected by all the physicians, but no physical signs found. In December the patient left the city, and soon grew worse. The cough, chills, and fever returned. Sputum was sent for examination in January. Tubercle bacilli were found by Dr. Fell and Dr. Buswell. The patient returned to the city in February, and then all the physical signs of phthisis were found, indicating a cavity in one lung, and some change in the other. The case then ran the usual course of phthisis.

Another case is that of Mrs. L., living near Youngstown, N. Y., aged 35. She had had what was considered a severe bronchitis for some time. Tuberculosis was not diagnosticated, but an examination of the sputum revealed tubercle bacilli some two months before she died.

I might add a number of similar cases to this list, and also some in which the results were negative. Of the latter I will present but a single example:

Mrs. F. R. C. Diagnosis, tuberculosis of the lungs. There appeared to be evidences of approaching dissolution, and the prognosis was unfavourable, but an examination of the sputum failed to reveal tubercle bacilli, and the patient is now reported to be in excellent health.

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THE RATIONAL METHOD OF DRESSING THE CORD AND NAVEL IN THE NEWBORN INFANT.

By Henry F. Risch, M. D., of Kings County.

To give the history of the modes and customs of all nations from times antediluvian and antememorial regarding this theme; to speculate on the fact that the first mother of humanity had neither scissors to cut nor cord to tie with; that this or that nation or people, at this or that time, left the cord so many inches or so many feet long, or, like the Chinese, left the whole cord, with the whole placenta attached, snugly rolled around the child, to dry up and fall off, or to rot off, with all the danger of septicaemic infection,—this would certainly be very interesting, and demonstrate that in this, as in many other things, we do not think for ourselves, but, like the herd, follow the well trodden trail of the ages.

It is certainly surprising that with all our modern antisepsis and asepsis there has been to my knowledge no proposal made to apply the same principles also to the dressing of this very important stump after "infantotomy."

When in college I was taught, and the present text-books still give the same directions, to leave the cord about two inches long, that is, to tie about two inches from the navel, and, again, one to two inches further, and then sever between both ligatures. Professor Lusk, in his text-book, says, leave about two inches for convenience; but may we indulge in a convenience when there is delay in healing, and sometimes a fatal issue resulting therefrom?

After tying and section of the cord, a two-inch stump of the umbilical cord remaining, the latter, that is with a dry dressing, is given a chance to dry up or mummify. It commences to dry up from the extremity toward the navel, and, when sufficiently dry, the stump generally separates. It is much worse if it is kept moist with oil, or, as often happens,

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by the child's urine. Here the stump becomes in a few days a slimy, putrefying mass; and this is all going on, with these more or less open vessels in continuity with the tender living organism, without any barrier. If gangrene occurs in a limb, the surgeon, not knowing to what extent the limb is doomed, sometimes defers operating; but in this case we know the exact line of demarcation. Wherefore, then, allow the dead in contact with the living until the first rot off, without action on our part to prevent putrid absorption?

At one of the meetings of this Association, I believe three years ago, Prof. Lewis Smith, Professor of Diseases of Children in Bellevue Hospital Medical College, read a paper on the subject of deaths of infants from different kinds of septicaemic infection by way of the stump or navel wound, and I at that time, unfortunately, could cite two fatal cases from like causes.

Whenever there is a red areola encircling the navel, it is a sure sign of septicaemic invasion. This, if recognized early, everything foul removed, and the wound thoroughly disinfected, will be remedied; but if untreated for a few hours it becomes indurated, and spreads from one to two or even three inches in circumference, and the infant's forces are being conquered. A phlegmonous cutaneo-cellular erysipelas soon invades the whole abdomen, chest, back, and thighs, and in a day or two death ensues. That there is a greater danger of such a tragic ending when there are or have been zymotic diseases in the same house, as diphtheria, scarlatina, erysipelas, or puerperal fever, is certain; but rarely is there ever any real lack of seed for a very favourable soil in the atmosphere, especially in large cities.

So far the disadvantages of the old and time-honoured method of managing the umbilical stump: now I will try to show the advantages and disadvantages, as far as I can see them, of the method to be proposed by me, and practised by myself and my brother Dr. Otto Risch, for a number of years, to our great satisfaction.

The cord is tied with a strand or more of thick silk, just

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exactly on neutral ground, between what belongs to the child and what does not, as near as possible, erring, if must be, rather toward the umbilical cord than toward the child, to avoid including any real integument in the loop; then the cord, after tying the usual second ligature *on* the cord, is cut between the two ligatures, but as near the ligature on the navel as safety from slipping will allow. The jelly of Wharton is then industriously rubbed out, and then the little stump most carefully dried, and either enwrapped in the time-honoured burnt linen or muslin, or, better, it is dressed with powdered charcoal, or, yet better, with animal carbon.

The navel band must be kept dry by all means. The diapers should be changed frequently to prevent moistening of the navel dressing with urine, and as often as that occurs the whole dressing has to be renewed.

When the dressing remains dry, it is not changed until the little stump drops off, usually on the second or third day. The navel wound left, if any, is very small. A dressing with a little charcoal or the burned rag completes the treatment. The navel formed after such procedure is very much smaller than it otherwise would have been; neither does it ever protrude. The ligature being applied where the jelly of Wharton has ended, runs no danger of getting too loose by shrinkage of tissues, causing possible secondary umbilical haemorrhage.

The ligature, applied where it is, effectually bars out any absorption from the decomposing stump, also all organisms of disease. The jelly of Wharton being all rubbed out, there is but very little moisture to be dried up.

The only objection that occurs to me against this method is, that you cannot so handily wrap up the stump and lay it to the conventional left side; but this again becomes an advantage, since, being short, the stump depresses the navel, that it may not thereafter protrude.

Certainly the most expeditious method of treating the stump would be to sever with a knife where I tie, and then, like an ovarian stump, sear with actual cautery. But I think the world is not yet ripe for such a radical innovation.

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THE TREATMENT OF UTERINE FIBROIDS BY ELECTRICITY.

By Henry D. Ingraham, M. D., of Erie County.

Much has been written both in favor of and against the use of electricity for the purpose of dispelling uterine fibroids. Some writers are very enthusiastic in its praise, while others are equally strong in their denial of its utility; yet several of the latter have made but little if any use of the agent, and base their objections to its efficiency upon theory.

The writer does not expect to present anything new or startling in this paper, but simply gives a brief *résumé* of his experience with this agent.

He was not one of the first to resort to its use in the treatment of uterine fibroids, neither was he very sanguine that it would accomplish the wonderful results attributed to it by some who were using it. Failures had been witnessed in its use for this and other purposes, where its enthusiastic advocates claimed, before its use, that there could be no failure. Yet it appeared that enough good was accomplished by its use to at least justify a fair trial. Accordingly, about a year and a half ago I began its use in the treatment of uterine fibroids; at first, somewhat crudely and imperfectly, but later, in a more scientific and systematic manner. My first attempts at its use were with a thirty-cell portable battery, which sometimes did not work satisfactorily. After examination and trial of several different batteries, which were more or less complete, I finally settled down to a battery of forty-six Leclanché cells, axo pattern, placed in my cellar, with a milliampere meter and current controller on a shelf near my operating table. These, with proper electrodes, are all that is needed for gynaecological work. I do not claim that the cell which I have is any better than several others,

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but it is a very good one, and answers the purpose for which it is intended.

For some time I used the Bailey rheostat, but later have used the current controller recommended by Dr. Massey in his work, "Electricity in the Diseases of Women," and so far like it better than the rheostat. The kinds of electrodes used are of considerable importance, especially the abdominal ones. From my experience, which has been considerable, I think the electrodes of potters' clay much better than any other form of abdominal electrode, and that the clay or Martin's water electrodes are the only ones so far devised that are at all suitable. The greatest objection to the Martin electrode is, that it will at some inopportune moment spring a leak, and wet the clothing of your most fastidious patient. The wire or perforated plate electrodes are not pliable enough to be adapted to the abdominal irregularities in many cases, and, even if well covered with wet towels or cotton, will burn the skin in places when strong currents are used. Since reading the article of Dr. A. Lapthorn Smith, of Montreal, in the August number of the "American Journal of Obstetrics," I have used the form of abdominal electrode recommended by him, and I find it better than anything else with which I am acquainted.

Although I have used electricity in the treatment of many, in fact, most, of the diseases peculiar to women, yet in this article reference is made only to its use in cases of uterine fibroids, and the limits of this paper permit only a brief reference to these. Notes of ten cases will be given as concisely as possible. I have other cases, but the time since the beginning of treatment has not been sufficient to determine what the result will be.

CASE I. Miss I., aet. 31. Fibroid in posterior uterine wall, filling pelvis, obstructing the bowels, and causing frequent micturition. Menstrual flow more profuse than formerly. Uterus three and one half inches. Had suffered from the tumor for past five years, gradually growing worse. After twenty-five applications, during a period of three months, the tumor had nearly disappeared, and the patient was relieved of all the

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unpleasant symptoms. From seventy-five to one hundred and seventy-five milliamperes were used.

CASE II. Mrs. C., aet. 40; mother of three children. Sub-peritoneal fibroid, extending above umbilicus, and accompanied by the usual symptoms, except that there was not much menstrual disturbance. Twenty applications, ranging in strength from seventy-five to two hundred and fifty milliamperes. But little improvement.

CASE III. Miss W., aet. 35, colored. Large multiple fibroid, filling pelvis, and extending above umbilicus. Uterine cavity three and one half inches. Forty applications, covering a period of four months, four with intra-uterine positive pole; tumor very much reduced in size, and patient practically well. From seventy-five to two hundred milliamperes used.

CASE IV. Mrs. L., aet. 34; mother of one child ten years old. Large intra-mural fibroid, extending above umbilicus. Menstrual flow profuse, and continuing for a long time. One application of positive pole checked the excessive menstruation, and three more controlled it. Thirty applications reduced the uterus to nearly its normal size, and relieved unpleasant symptoms.

CASE V. Mrs. S., aet. 32, married; no children. Medium sized sub-peritoneal fibroid, with the usual symptoms. After twenty-three applications, no appreciable change.

CASE VI. Mrs. B., aet. 42; no children. Large intra-mural fibroid, with profuse and prolonged menstruation and all the other usual symptoms. Patient very anaemic. Uterus four and one half inches deep. Positive pole used in uterine cavity three times; twenty-six applications in all, varying from seventy-five to two hundred milliamperes. Profuse menstruation stopped; tumor reduced one half or more in size, and all unpleasant symptoms very much relieved.

CASE VII. Miss B., virgin, aet. 47. Large fibroid, extending above umbilicus; appeared to be a uniform enlargement of whole uterus. Cavity three inches. Pain and uncomfortable feelings from pressure. Menstrual flow normal. The thorough and persistent use of electricity did not produce any change.

CASE VIII. Mrs. L., aet. 27; no children. Large intra-mural tumor. Uterus filling pelvis and lower portion of abdomen. Menstruation profuse, occurring too frequently. Positive pole used at first, later the negative. Forty applications in all. Haemorrhage controlled; tumor reduced in size, and other unpleasant symptoms dispelled.

CASE IX. Mrs. S., aet. 39; married eight and one half years, no children. Large intra-mural fibroid, reaching above umbilicus. Uterus measured five inches. Menstruation irregular, but profuse at times. Made a few applications of seventy-five to one hundred and fifty milliamperes, but patient became discouraged and did not return for treatment.

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CASE X. Mrs. K., aet. 33; one child. Small intra-mural fibroid, apparently the size of a large orange, causing considerable disturbance of bowels and bladder. Twenty-eight applications of seventy-five to two hundred milliamperes caused the tumor to almost completely disappear.

In the above cases the treatment was at my office, with one exception. A vaginal douche of bichloride of mercury, or permanganate of potash,—usually the former,—was used by the patient at her home, both before and after the application. The patient usually rested a short time on a couch in the office before going home. The current was generally as strong as she could bear comfortably.

It will be seen that of the cases reported, although absolute cures are not claimed for any of them, the tumors were very much reduced in size in six of the ten cases. The three cases in which haemorrhage was present were completely relieved as far as that symptom was concerned.

The neuralgic pains, and those due to pressure, were relieved in the six cases benefited. In three cases,—numbers three, five, and seven,—although the electricity was faithfully used, no perceptible benefit was manifest in any respect.

Case number nine became discouraged before any marked improvement was manifest, or before a fair trial had been made, and gave up the treatment. Although there was no haemorrhage in this case, yet the menstrual flow was profuse, and at first the positive pole should have been used instead of the negative. Had it been, doubtless the patient would have remained under treatment, and presumably received the benefit which the appearance of her case seemed to promise.

It will be observed that puncture was not resorted to in any of the cases reported. Had it been, I think that the result would have been different in the cases not improved. Although I am using this mode of treatment now, I have not had a sufficient experience to justify any positive statement in regard to its value. It will be noticed that intra-mural tumors were the ones most especially benefited by the use of electricity.

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It will also be observed that in all the cases reported, with one exception, the tumors were large. They were cases in which it would be very difficult, if not impossible, to remove the ovaries; neither would hystorectomy be an easy or safe operation. Where the tumor is small, and there is a fair prospect of being able to remove the ovaries, electricity may be contra-indicated in the minds of many excellent practitioners. Yet I cannot see the objection to giving it a fair trial even in these cases, because, if properly used, no injury will be done, and operative procedure can be resorted to later if necessary.

As uterine fibroids are benign in character, and sometimes diminish in size or disappear without any apparent cause, it is well not to be over-zealous in treatment unless some good reason for interference exists. It is difficult to understand why there should be any objection upon the part of any one to the trial of this agency for the purpose of dispelling uterine fibroids, where some means must be resorted to for the relief of the patient, and where an operation must necessarily be very dangerous and death result in a large proportion of cases.

To the daring surgeon, no doubt, hystorectomy is more fascinating than the use of electricity. The result is reached much more quickly by the former than by the latter method, often much more quickly than is desired. If, however, the patient recovers, her gratitude and that of her friends is great, and the operator is considered vastly more skilful than he would be had he dispelled the tumor by the use of electricity. Although the latter method does not usually cause the complete disappearance of the tumor, yet in a large percentage of cases it lessens its size more or less, the unpleasant symptoms are dispelled, and the woman is practically well. And all of this is done without mutilating the patient—a procedure abhorrent to most women. In the language of one of the most celebrated of gynaecologists,—"What more does a reasonable woman, who has suffered much, desire or need?"

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ALCOHOLIC PARALYSIS.

By T. D. Crothers, M.D., of Hartford, Connecticut.

This term is used to describe multiple neuritis of the peripheral nerves. It is an acute inflammation of the nerve tissue and fibres, and distinct from other forms of neuritis. The symptoms are extreme neuralgia, acute pains, motor and sensory paralysis. The specific cause, alcohol, has some unknown action on the nerve centres, or affinity for nerve tissue, or acts through some peculiar degeneration of the blood corpuscles. The disease is progressive, and the diagnosis becomes less and less difficult as the prognosis becomes more grave.

I purpose to point out a new form of alcoholic paralysis, not noticed before, which may be said to bear the same relation to general paralysis that alcoholic neuritis does to general neuritis. It is a distinct form of brain paresis, with a distinct range of psychic symptoms, merging into some form of insanity, or terminating in death from some acute inflammation. It differs from general paralysis in the absence of sensory and motor palsies, and the dementia which follows in that disease. The psychic symptoms vary. Delusions of grandeur and power are never seen unless there be concomitant general paralysis. Transient manias and temporary deliriums are common. Symptoms of strength and weakness, of idea-motor vigor and idiotic prostration, follow each other.

This form of paralysis appears in two distinct classes of cases, popularly designated as "fast men,"—meaning men who are noted for their general excesses and irregularities of living. More definitely, they may be described as persons who hurry through life, indulging every animal instinct and impulse, regardless of all prudence and obligation, beginning after the use of alcohol, and associated with its continued use.

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The first class of alcohol paralytics are those who have been temperate, reputable persons, who have lived correctly, and had the confidence and esteem of others, then suddenly, after a long or short period of alcoholic drinking, become disreputable, show great irregularity of living and conduct, and lose all sense of right and wrong. The following are histories of actual cases:

A., a physician, at forty-five was a leading man in his profession; honest, temperate, moral, religious, of good judgment; admired, trusted, with pride of character, and ambitious to obtain greater eminence. He occupied many positions of trust, was married, moved in the best circles, and had been successful beyond the average. After a period of over-work, he began to use spirits at night to obtain sleep. This habit increased until he came to taking spirits many times a day. He never seemed intoxicated, but at times would fall asleep from stupor for a few minutes, then waken and go about as usual. Soon after he began to use spirits, he neglected his promises, denied his obligations, and told falsehoods that were apparent and without motive. He quarrelled with his neighbors, slandered them and then denied it, cheated his best friends, neglected his family, frequented bad houses, followed up horse races, lost his property, separated from his wife. Thus for several years he rapidly degenerated until he became a criminal pauper, and died in jail of pneumonia. This retrograde march was and is yet considered a voluntary, wilful giving way to a depravity of the heart.

B., a manufacturer, at fifty years of age was a model man in society, in business, and in temperate living. He was of excellent judgment, of scrupulous honesty, benevolent, with great pride of character and position. After a journey to Europe he began to use spirits at the table; and within a year or more he was intoxicated at night at home. From this time a change of character began. He denied business contracts, and went to law—was defeated; made poor, dishonest goods; and entered on a career of cunning and trickery. He became avaricious, showed bad judgment in dishonest transactions with his best friends. He drank every night, and often to stupor, and frequented fast company; bought lottery tickets, joined a swindling oil company, separated from his wife, and lived in a low hotel. He finally lost his property, was sentenced to jail for forgery, and died of some acute disease. No one suspected that his condition was one of disease, and he was regarded as a depraved, abandoned man.

C., a judge, forty-eight years of age, whose previous character for temperance, honesty, truthfulness, and uprightness of conduct was irreproachable. After the death of a favorite child, he began to drink spirits every

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day as a medicine. Gradually he became excitable and coarse in his manners; used profane language; was unreasonable in his rulings on the bench; neglected his personal appearance; was seen driving fast horses on Sunday; and drank openly with low people. He accepted bribes; had to resign from the bench; and became a low police-court lawyer of the most disreputable character. He drank steadily, and was intensely dishonest and unscrupulous, having no respect for himself or for others. He died suddenly from some unknown affection.

These cases fairly portray a class that comes under the observation of physicians more and more frequently, and has given rise to the most contradictory theories as to the cause and nature of the degeneration present. Some of these cases exhibit unusual sexual impulses and exaltations, and keep mistresses secretly or openly. Others develop a mania for the accumulation of wealth by unusual means and methods. Others manifest a mania for office, and go into politics, becoming influential by their unusual acts and conduct.

The second class of alcoholic paralytics are more common, but attract less attention. They are the young men under thirty, who have never formed any very marked character or habits of temperate, correct living, and who, soon after using spirits to excess, show great degeneration of the higher attributes, and become mental and physical paupers. They are the fast young men, who wreck fortunes and destroy themselves, dying of acute disease, or becoming demented. They are the men who come of good families, who have had good surroundings and training, and who give no premonitory indications of this disorder before it begins. The following are some common cases:

A., an educated man of twenty-two, who formed a partnership in a successful house, and was exemplary and correct in every way, suddenly began to drink strong spirits, and then joined a club. He was expelled from partnership a year later, and became a clerk, then a bar-keeper; married, and wrecked his father-in-law's fortune in Wall street. He was low and cunning, getting money by various means, and throwing it away as recklessly as he obtained it. He was a gambler and swindler, and drank steadily. His father cast him off as incorrigible. He served short sentences in prison for swindling and forgery. His grandmother left him a large property, and a medical commission decided that he was

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competent to hold and use it. He died of meningitis a few months after coming into possession of this property. His father was a temperate, exemplary farmer, and his early surroundings had been good.

B., the only son of an eminent physician, had the best of care and training in childhood. He was finely educated, and became an assistant to his father. At twenty-two years of age he was a man of genius and ambition and great personal pride. He began to use strong spirits every day, and soon afterwards his entire character changed. He became intriguing and slanderous, unreliable and dishonest to his patients. Later he ran away, after forging his father's name, and two years afterwards returned, a low quack and street vender of Indian medicines. He was not seen intoxicated, but drank constantly, slept in a tent, and begged help from his old associates. His father disowned him. For two years he lived as a tramp and street huckster, and then died from blood poisoning, following an injury.

C., brought up well, entered on a business career of great promise; married, and was very successful—the rising man in the village where he lived. He began to drink. Five years later he was a low bar-room politician. Dishonest, sensual, fawning, and abandoned by his wife and all respectable people, he finally died during an attack of delirium from spirits.

These very common cases exhibit many curious phases of early degeneration which clearly follow the use of alcohol. Their development does not appear to follow any fixed law, but to be the result of chance. Those of the first class often show some persistent course of intrigue, or avarice, or ambition for place or power, or some ideal of great shrewdness and love of emulation, or love of approbation. Those of the other class are devoid of any persistent line of action, and are fickle and changeable as the wind,—at one time professing to do this or that, and the next moment doing the opposite. Sexual irritation and degeneration, love of change, excitement, hurry, and confusion, are often prominent symptoms.

The coördinating centres seem broken down, and all persistent and consistent conduct becomes more difficult. The realisation of duty and the consequences of conduct becomes more and more faulty.

These cases have often a neurotic inheritance, and are predisposed to conditions of nervous exhaustion. The nerve centres are unstable, and, in the younger men, are never fully

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developed. In the older cases, imperfect and faulty nutrition exists. In both cases alcohol has some peculiar and distinctive action on the nerve centres. The continued disturbance of the cerebral circulation always shows itself in defects of consciousness and mental confusion, with a blunting of the memory. This first and most common action of alcohol (derangement of the cerebral circulation), although largely unrecognised, has a marked influence on the centres of the highest cerebral activities. They are damaged, and finally palsied; then the lower centres are affected; and finally, the lowest organic centres are invaded;—then death takes place. All the alcohols are hypnotics and paralytics of nerve action and the nerve centres.

The latest conclusions of scientific study indicate that alcohol acts either directly by some peculiar chemical affinity or combination with the nervous tissue disturbing and altering the process of oxidation, or, by contraction of the protoplasm of the nerve cells checking oxidation and functional activity. In all cases the blood is changed, and its power of maintaining the functional activity of the nerve cells lessened.

The "alcoholic" always exhibits symptoms of nerve and brain degeneration. A marked retrogression, or falling to lower levels of thought and action, is always seen. Often this degeneration is regularly progressive, and can be traced from step to step—from palsy of the highest brain centres down to paralysis of the lowest organic centres. At one extreme there is exhilaration; at the other, intoxication and stupor. The ordinary inebriate exhibits the entire line of dissolution, from the quickened brain circulation to the organic paralysis that ends in death. The alcoholic "paralytic" shows the same dissolution, only it moves slowly along an organised path, and in reverse order to the brain and nerve development. He is unconsciously "dying at the top:" the highest powers of brain and nerve are undergoing degeneration. Delusions of capacity and strength grow with increased weakness, and his consciousness of the nature of his thoughts and acts becomes more and more confused.

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The power of coördination and discrimination fades away. Experience, reason, and judgment are lost.

While the higher faculties are palsied, the lower organic functions may go on more or less perfectly, rendering his real condition obscure; he may appear and act in many respects as before, and yet be a paralytic.

These cases of alcoholic paralysis may, as an aid to their clear definition, be grouped in the following classes:

1. Those who, after the use of alcohol, manifest great changes of character and degeneration of all the higher elements of brain function.

2. Those who, after the use of spirits, become "fast men" in a general sense, living badly, acting strangely, steadily growing from bad to worse; often manifesting great extremes of weak judgment, etc., etc.

3. Those who, whether young and inexperienced, or middle aged, occupy responsible positions, and are centres of widespread influence, and who suffer seriously from ignorance of the real nature of their disorder.

4. Those who for years may go on without any very positive physical symptoms, but who mentally and physically are degenerate and defective almost to idiocy; whose higher mental operations are profoundly debased and broken up.

5. Those whose disease always terminates in some acute inflammation or low form of dementia, passing rapidly to a fatal issue. Motor and sensory paralysis are always secondary, and never prominent. Pneumonia and tuberculosis are the most common *sequelae*.

The effect of these cases upon widespread interests, their magnitude and intimate association with all true progress and civilisation in every community, give them a special medical and scientific interest.

When these cases are studied and the symptomatology compared, a striking uniformity is apparent, and an orderly succession of events in each case points to a disease—a dissolution of the brain and nervous system, in a regular order, the reverse of that of evolution. Dr. Jackson's views of the

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evolution and dissolution of the nervous system are strikingly confirmed in a study of these cases. My purpose is to call attention to them, and to question the correctness of the public sentiment which regards them only from a moral and theological stand-point as vicious and wicked, and at all times competent to change of their own free will.

As medical men, these cases appeal to us with the same intensity as if they were new forms of bacterial disease. As scientific men, they appeal to us as new phases of the great laws of evolution and dissolution, which govern the operations of the brain and nervous system beyond the realm of chance or accident.

To-day these alcoholic paralytics astonish the public by their disreputable and dishonest acts, are a source of amazement to their friends, and produce great alarm among moralists and theologians. As criminals, their very boldness and unreasoning conduct point clearly to unsoundness of mind and disease. As low, disreputable men, whose previous character gave no intimation of such a course of action; as delirious politicians; as credulous, unstable followers of new isms; as skeptics and doubters of everything, living unusual lives, and doing strange, unusual things, such as the making of unusual wills,—they are the wonder of the hour. One of these cases left the remnants of his fortune to his mistress, and the medical men called upon to testify swore that he was sane, although he had drank to excess for years. A medical man of fortune and prominence, who is an alcoholic paralytic, is awaiting trial for forgery to-day. Two lunacy experts have testified that he is sane, irrespective of the fact of ten years' steady drinking, and a total change of mind and character during that time. A noted clergyman abandoned his pulpit and went into stock gambling, and became a low, disreputable man, this change dating from the excessive use of alcohol at night. The family physician asserts in a daily paper that this man was not diseased or unconscious of his acts. A medical man in this city, who had inherited a fortune, has been impoverished by his son,

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an alcoholic paralytic, and been forced into a menial position to earn a living; but he still clings to the delusion that his son has a mere habit, which he could break from if he chose.

This is an example of the erroneous attempt to explain all unusual or obscure conduct from a moral and theological stand-point. The remedy was always severe punishment. Thus for ages the world punished the epileptic and insane. But these diseases went on unchecked, simply because the causes were unknown. In the same way the alcoholic paralytic continues untreated. Moral suasion, prayers, pledges, appeals, all fail, because they do not reach the cause.

The problem is a scientific one, which must be solved by medical men. The inebriate and dipsomaniac, seen on the street and in the bar-rooms everywhere, are obviously diseased. The term vice, used in explanation of their conduct, is a manifest absurdity, except when used in a medical sense. The alcoholic paralytic occupies a different position. His alcoholic excesses are not prominent, and he seldom exhibits acute poisoning or intoxication. The failure of consciousness, of character, of morals, and the decline of the higher brain functions, are most conspicuous. As in all other matters of mystery, the first explanation is always sought in spiritual forces. But later, when these cases are studied and compared, a distinct range of causes is found, which follow a regular line of progress, obeying a certain order of events—a development, progress, and decline, to extinction in death.

The conclusions which I wish to make emphatic are,—

1. That this condition which I have termed alcoholic paralysis is a physical one, directly traceable to the alterations and changes of nerve cells and their functions by alcohol.

2. These defects are palsies, and their origin and progress are governed by unknown conditions, of which we can only catch glimpses now and then.

3. The causes being physical, the remedies are physical, and the possibility of finding means and remedies successfully

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to reach this class of cases becomes a reality, only awaiting a practical demonstration.

4. These cases belong almost exclusively within the province of the general practitioner. He can study them in the early stages, and supply methods of treatment before chronicity and incurability supervene.

5. The time has come for medical men to recognise and study these cases, and point out the facts and the laws which govern them.

The armies of scientific advance have arrived on the borders of this new realm of the brain and its diseases, and every day the fact becomes more and more apparent that the same causes, the same laws, are in operation here as in other parts of the body. The mystery of mind and matter, free-will, responsibility and accountability, breaks away with every advance of scientific study.

Along these very frontiers, where the study of bacteriology, cerebral and abdominal surgery, and other medical topics, reveal the possibilities that await further and more accurate investigations, we shall find this new, unknown realm—brain palsies, both local and general;—palsies that come from external poisons, like alcohol; that come from injuries, physical and mental; that come from defective nutrition; that come from age and degeneration; that come from poisons formed within the body; palsies that manifest themselves in varied and most complex mind degenerations and what are called moral defects.

To-day alcoholic paralysis stands out most prominently as needing investigation, and the facts I have brought out are only outlines to be filled in by further and more accurate study.

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DISCUSSION.

DR. E. D. FERGUSON, of Rensselaer county, asked Dr. Crothers if, in his experience, he had met with any great number of instances of alcoholic paralysis involving the cerebral centres, with rather rapid advance of death.

DR. CROTHERS answered that he had.

DR. E. M. MOORE, of Monroe county, said he had listened to the paper with great pleasure, not only because it marked a new departure, but one which had lingered in his own mind many years, giving form to many things he had himself thought of. We all know the great difficulty which surrounds the question of the incarceration of persons we recognise as being unable to abstain from alcoholic stimulants. A man becomes intoxicated, and we all recognise the temporary insanity that exists while the alcohol circulates through the tissues. The error we are apt to commit is, that we regard the condition as wholly temporary, ceasing as soon as the debauch is over. This paper takes the right view, that not only does it not pass away, but that there is a profound change which may perhaps never pass away. We have no difficulty in controlling these people, if they need it, when we make up our minds to believe them insane. We can have them controlled or shut up until there is some prospect of their recovery. It seemed to him that this was opening a line of study that would give us this privilege, and perhaps would produce some desirable modification of legislation.

DR. A. L. CARROLL, of New York county, said Dr. Crothers had done one good thing in bringing forward the fact that the toxic action of alcohol is always a paralysing one. He thought it would bring about a better result than any legislation, if, instead of speaking of alcohol as a stimulant, it were made plain that beyond a small amount which could be oxidized its action was always paralysing. He had no doubt but it had been the experience of every practitioner present that persons whose faces flush with a small amount of wine are persons to whom it should not be given under any circumstances. That flushing is the first paralysing effect. This point was never, so far as he knew, emphasised in text-books and lectures. Alcohol is spoken of as a stimulant, not as a paralysing drug. Before the alcoholic habit could be acquired, he thought there must be some predisposing cause. We know that there are thousands of men who use it temperately, and who apparently are never injured by it. There are others who, even after a long life of temperance, but having already an unstable system, are led into the alcoholic habit by perhaps a single glass of wine after dinner. He would be inclined, with all deference to Dr. Crother's experience, to class inebriates

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in two categories. On the one hand, the man who is simply vicious, and from self-indulgence acquires a habit of steady drinking. The disease is more a gastric than a nervous trouble. On the other hand, the dipsomaniac, who is the victim of a neurosis. He can remain abstemious for weeks and months, but the time comes when his appetite arises: he resists it, struggles against it perhaps for weeks; finally he yields.

He added that he would like to hear Dr. Crothers define more clearly what is to be considered an intemperate use of alcohol. Some years ago he with others endeavoured to ascertain the amount of alcohol that could be oxidized and converted into energy within the body. They had all agreed that between one and two ounces of alcohol could be oxidized by an active man. He would like to learn whether Dr. Crothers has established a better means of estimating the dividing line between the dietary use and the paralysing abuse of alcohol. Of course individual differences should be borne in mind. Some persons cannot stand alcohol in any quantities.

DR. CROTHERS, closing the discussion, said that Dr. Carroll had propounded a question which it would require the wisdom of another century to answer. To determine the amount of alcohol which is reasonably proper, is a question that will not be answered for two hundred years to come. Researches to-day indicate that the relations of alcohol within the body are so complex, and the conditions under which it may be of value so many, that at present only a rough answer can be given to the question. The line of investigation in these cases is clinical. We want to know, and can only know, what general changes and symptoms alcohol produces. How it acts, why it acts, are questions we must leave for the future to answer.

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A FEW FADS.

By H. D. Didama, M. D., Syracuse, N. Y.

Fad: A favorite theory, a crochet, a hobby.
—*Imperial Dictionary.*

Fads are not necessarily falsehoods. They may be whole truths. They are more likely to be fractions of truth.

A fad may be likened to a heap of meal. It may be a spoiled batch, ground through a rickety mental mill by a crank. It may be a clean, carefully bolted, nutritious flour from the factory of a competent miller. It is apt to be a mixture, in indefinite proportions, of the two goods—the good for something and the good for nothing. A fad, too, may be considered under the similitude of a blossom. Thus, there may be faded fads, fading fads, fads still in full bloom, and buds of promise.

This paper is to describe briefly and superficially a few of the modern fads which have been and are. The serious and scientific discussion is reserved for the eminent gentlemen who are to follow.

FADED FADS.—I. BLUE GLASS.

In military matters dear old General Pleasanton was an authority. And so when it was announced that he had found the light coming through blue glass, by actual experiment on vegetables and animals, to be a potent invigorator, promoting rapid growth, restoring lost colour to the pallid cheek of beauty, putting a new backbone into nervous prostration and causing it to frisk like an antelope, is it a wonder that people over all the land believed him, and not only put blue panes into their windows, but even erected azure solaria, whence all vulgar light was rigidly and contempt-

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uously excluded? It stood to reason that a great general should be not only first in the field, but first in therapeutics. But the blue glass man was not the real General Pleasanton of the army.

Testimonials, verified by affidavits, were furnished in countless numbers. Many legal gentlemen and clergymen, a few ladies and some doctors—chiefly of the Athenian variety—overwhelmed by the authority of the military chieftain, and the testimony of legions of his rapturous disciples, were led to test the cerulean wonder. Nothing, they argued, should be condemned without a trial. They surrendered their own non-resistant doubts with hopeful alacrity. They wrote charming rhapsodies for the daily press.

Mrs. A. had been a paralytic for twenty odd years. After two hours' exposure in the blue solarium, her contractured muscles became as limber and agile as an eel. Miss B. lost her voice eight years prior to the new treatment. The best specialists of the metropolis and the most powerful medicaments had been employed in vain. A single heaven-coloured seance cured the aphonia, and a repetition restored her musical powers, greatly to the surprise, if not delight, of her long-suffering neighbours. And so through the alphabet, quite down to izzard.

The call for blue glass was continental. The prices became altitudinous as the Alps. Factories could not supply the demand. And yet some physicians, seemingly of good judgment and intelligence on other matters, not only had the temerity to doubt the efficacy of the immortal discovery, but they actually attributed the alleged results to imagination and faith and expectancy. Some audacious conservatives even went so far as to tempt the thunderbolts of heaven by heaping ridicule and contempt upon this crowning glory of the age.

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Alas for the transitory nature of all sublunary good! In a few short weeks the hardware merchants were trying to give away their stock of unfashionable window panes, and

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the poor dethroned Panacea herself went, with tears in her beautiful blue glass eyes, and sang in a heart-broken and dolorous pitch to Pleasanton,—

> "There 's no one left to love me now,
> And you, too, may forget."

II.—MEDICATED WIND.

Dr. Bergeon was a French physician of some note. So when he declared recently that he could expel consumption from the human system, and that he had actually, in a great number of cases, driven out this dreadful disease—fairly smoked it out, as it were—with a malodourous gas, the medical profession in this country was suffocated with amazement. This, mind you, was no crude military notion. It was of professional origin, and Parisian at that. Doctors,—still chiefly of the Athenian persuasion—the Athenians, you remember, had leisure for nothing else but to tell or to hear some new thing—especially doctors in New York, and still more especially in Philadelphia, hastened into print, in the medical journals this time, recounting their exploits with the eureka remedy.

Consumption, they reminded us with unnecessary vehemence, is a disease of obstinate tenacity. Its bacilli hitherto had resisted successfully all attempts to dislodge them. They had laughed to scorn inhalations of carbolic acid and bed-bug poison, and had grown stout under the assaults of "Rough on Rats"—following in this respect the example of the rats themselves. But they succumbed at once when the attack—the rear attack—was made by hydrogen sulphide. They did not fold their tents like the Arabs and silently steal away, exercising their thieving propensity to the very last, but they died throttled at their posts, and bravely rampant in their trenches. Physicians, of whom the world never heard before nor since, reported scores and scores of cases all benefited by the gas—many entirely cured, and many more still confidently hugging the delusive phantom of hope. Gas generators, cheap at ten dollars a machine, were found in thousands of medical

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offices and at tens of thousands of consumptive bedsides. Improvement was so rapid and universal that agnosticism seemed contemptible ignorance and open scepticism a flagrant crime.

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But time flies so rapidly nowadays, it seems but as yesterday when the reeking gas-machines were consigned to oblivious closets in company with the disconsolate blue glass. The bacilli and the scoffers wear a triumphant smile. The great reaper finds no diminution in his immense consumption harvest. And the poor discrowned French scientist shares already, with old Grimes, the well known epitaph,—

> Bergeon is mortuus, that agathos old anthropos,
> Non videmus eum plus!

A FADING FAD.—ELIXIR VITAE.

Dr. Brown-Sequard is an American-Frenchman. Not content with the half-and-half sanguinary fluid coursing through his antiquated veins, he determined to enrich it with the blood and juices of the succulent and untiring swine. The effect, according to his own report, was instantaneous and magical. The slender and brittle tenure of his life—the three-score-and-ten-year, so to speak—was fortified fifty-fold; the scrawny legs, which had been rattling around in his lean and slippered pantaloon, speedily became of an edematous plumpness; and the hoariness of his well earned age was transformed in a day into the raven hued locks of childhood—genuine, incontestible second childhood.

As Dr. Brown-Sequard was an eminent physiologist and pathologist as well as a Gallic-Yankee, it need excite no surprise that the Parisian experiments were repeated in this country. Reports of them have largely encroached upon the broad and sacred space devoted in the newspapers to encounters in the diamonds and within the rings. An amiable neurologist, who retired from active military life, and who writes medicated romances, hastened, with characteristic alacrity, to employ the new elixir, but he instinctively preferred the

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lamb, the emblem of innocence, to the coarse but persistent pig. The softly cooing turtle-dove could not be utilised, for turtles of the right persuasion are always scarce in Washington, while complaisant lambs are abundant everywhere, even in Wall street.

The limit of this paper will not justify a further and unnecessary sketch of the blooming and fading of this imported fad. As usual, some scoffing cavillers stood ready to suggest that the trials were worthless because every second donkey subjected to an injection had not received as a control culture milk and water instead of the nasty emulsion.

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Why is it that, in this age of amazing discovery, there be people who brazenly harbour shameful doubts about every new thing?—who fearlessly question the veracity of Jules Verne?—who will not fully credit even the personal observations of Baron Munchausen? Just now these carping wretches may be heard singing in ghoulish glee,—

'Tis the last fad of summer
Left blooming alone;
All its lovely companions
Are faded and gone.

FADS IN FULL BLOOM.—I. THE GASTRIC INSTINCT.

Dr. Beaumont ascertained by ocular inspection the digestibility and indigestibility of the various articles of diet. Some foods, like boiled rice, pigs' feet, and tripe, leave the stomach in an hour. Some, like hash and baked apples, tarry longer. Infantile beef is less soluble than the parental steak. Roast pork lingers lovingly in the gastric region for five hours or more. At sea, however, all these rules are suspended, so that tripe and hash and veal and the luscious swine-flesh all leave the stomach simultaneously.

The medical profession and the laity for a long time agreed that indigestion, and dyspepsia, which is painful digestion, arose from eating too fast, too much, the wrong thing, or at

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the wrong time. The pathological condition might reside in the mucosa, the muscular tissue, or the nerves. Correcting errors of diet and regulating ascertained morbid action were regarded as chief factors in the treatment. Advice as to what, how much, and when to eat, and what to avoid, constituted not a small part of the doctor's daily duties. In recent times we are admonished by the highest metropolitan authority, and by our mind-cure sisters, that the stomach itself is the best judge of what and how much it needs and can digest. And the rule has been formulated, Whenever your stomach craves anything, eat it and drink it till the demand is satisfied. This is a dietetic fad, but it has some—a little—nutritious truth in it.

Dyspepsia in many instances is a gastric hyperaesthesia of mental origin. The poor sufferer often has little to do but to study his symptoms, to weigh and measure and cut down the amount of food taken, and to abstain from everything which he imagines or has been told will hurt him. Emaciation sets in; his general debility increases, so that slight exercise induces fatigue; gastralgia is more and more aggravated by every variety of even the blandest articles taken, and the victim at length consults a judicious physician, or falls into the hands of those who profess to believe that they can cure all diseases by thinking at the patient. The physician assures the dyspeptic that he has no organic disease; that his fears of cancer are groundless; that by abstinence he has so impoverished his blood that no adequate gastric juice can be formed, and that the scanty amount which is secreted is of such poor quality that it can only half digest, and with great pain, the little nourishment he ventures to take. The advice is, to ignore his symptoms, to cast aside his fears, to exercise freely, and to enrich his blood by eating when hungry and drinking when dry, and to let the stomach decide as to the quantity and quality of food it requires. The patient joyfully pays the liberal counsel fee, heeds the advice, and recovers.

The mental healer, after prolonged meditation, which con-

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stitutes the treatment, assures the patient that he is already healed of his gastric delusion, that disease has no real existence in the world. She orders him to eat of everything, especially of mince pie at bed-time. The injunction is obeyed, recovery follows, and the awe-struck patient gives glory to the power of mind over matter.

The writer has had a few cases of this kind. The healing influence exerted by his mind consisted in leading the patient to eat like a human being, and to relinquish bad habits, chief among which was making a jack of himself. There was nothing mysterious or specially laudable about the treatment. The food-cure did the business.

But nine tenths of the dyspeptic fraternity do not belong in this category. They are working men, given to appetite, and roomy inside. They have craved everything, and have always, with joyful alacrity, taken what and when they pleased. And yet they are now in the toils of painful digestion. The infallible stomach has proved a false guide. It does not know any better than its owners do what particular thing of the multitudinous ingesta has made the mischief, nor what is best to be done. The poor victims cannot afford to pay twenty dollars for an office consultation, and so the metropolitan magnate never sees them. Having too much pain and too little faith to visit the mind-cure sisterhood, these devoted worthies are deprived of the pleasure of commending the go-as-you-please diet, including the usual nocturnal repast. A sensible general practitioner is employed, who furnishes relief. He prescribes appropriate remedies; he indicates the kind of food and the mode of cooking. He proscribes bolting, and overloading, and eating at the wrong time, even if there be a morbid craving. Recovery is the rule.

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The average experienced physician regards as a fad the doctrine that the stomach of child or man possesses unerring wisdom. He knows that in unnumbered instances the disordered stomach is a consummate ass.

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The proprietor of each fountain is ready to make solemn affirmation, that, while some other springs may possibly possess Abana and Pharpar virtues, the real Jordan waters are found only at his establishment. The analysis by Professor Dusenbury shows that this spring contains twice as much Glauber's salt and four times as much calcic carbonate as any spring this side of Baden Baden, Carlsbad, or any other bad place in Germany. He exhibits unsought testimonials from local doctors, and invites attention to eulogistic notices furnished by certain city medical professors whose magnificent names are made more impressive by the long title-tails which are always appended and conspicuously displayed.

Some of these waters are chalybeate, some cathartic, some diuretic. Others are hot, "magnetic," or miscellaneous. Still others seem to be free from all mineral ingredients, and derive their excellent properties from certain occult healing principles which elude the research of the chemist.

In deference to the professional and proprietorial evidence offered, it may be confessed that these two hundred and odd famous springs in the United States are, one and all, sovereign remedies for every disease which flesh can inherit, or acquire by gift or purchase.

The writer of this paper has a letter before him from the proprietor of a "magnetic" spring, claiming that his fountain, the location of which it would be invidious to mention, not only cures such common complaints as diabetes and Bright's disease, but has actually cured hernia, specimens of which he furnishes on application. It behooves the abdominal surgeon to look well to his laurels!

If time permitted, the writer could point out that most of the mineral springs contain some ingredients useless if not hurtful by their quality or quantity. He could show from long continued observation that equally good if not better results follow the use of water artificially impregnated with desirable saline materials. He could demonstrate that, as

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regards the unmedicated springs, their salutary influence in renal and cystic troubles is due entirely to the great quantity imbibed, and not to an inscrutable vital potency which they possess. And he could indicate the marvellous recoveries that are constantly attending the daily flushing of the emunctories with from four to six quarts of common drinking-water. But time does *not* permit. Neither can more than a cursory glance be given to the

BUDDING FADS.—I. EYE STRAIN.

Two accomplished specialists in New York are inclined to attribute chorea, epilepsy, and various neuralgias to an unbalanced condition of the ocular muscles. They claim to effect prompt cures after regular physicians have groped and failed for thirty years. Half and quarter sections of hyperathletic muscles are made, and the myotomies iterated and reiterated, sometimes for months, till the ambition and self-seeking of each muscular fibre are humbled to the condition of its opposing rival; and then the fits cease, and the saintly dancing becomes an orderly walk over.

* * * * * * *

The essence of this fad seems to be mistaking exceptions for the rule. Physicians who are not oculists know that most epileptic and choraic attacks arise from injuries or reflex irritations, abdominal, gastric, spinal, cerebral, and so forth. And they know, also, that relief is afforded and that cures are effected by proper medication and a rigorous regulation of the diet.

II. NASAL ASTHMA.

That many cases of spasmodic asthma are connected with polypi and other disturbances of the nasal cavity cannot be denied. But to claim that the nose is the guilty progenitor of every attack of wheezing is to give this important organ undue prominence. The human proboscis has always borne the reputation of obtruding itself occasionally into affairs not

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its own; but it has been reserved to the modern rhinologist to classify all sorts and conditions of bronchial dyspnoea under the head of nosology. This fad must have originated in a limited observation. All asthmatics who consult the rhinologist have indeed nasal trouble. The multitudes who have no difficulty with the olfactory organ never go near him.

The controversy between the conservatives and the specialists is waxing warmer every day. At times it is violent.

* * * * * * *

The poor nose has long had its tribulations and enemies. It is tweaked and blown, and brought to the cruel grindstone. It has catarrh, sneezing, and epistaxis, and it gives a nasal twang to the voice. Yet it is always at the fore-front in battle. It has spirit enough at times fairly to blossom with indignation, and its clarion tones oft in the stilly night awaken the slumbering echoes and startle the delighted bedfellows.

Tradition tells us that, in the patriarchal era, the complete ablation of this ornamental appendage was seriously proposed and earnestly discussed, the great sanitarian and lawgiver opposing the project which his eloquent rhinological lieutenant zealously espoused:

> Aaron said to Moses,—
> "Let's cut off the children's noses!"
> Moses said to Aaron,—
> "No, no! let's let 'em wear 'em!"

It affords the writer pleasure, in conclusion, to announce that conservative surgery achieved a memorable victory on that occasion, in token of which the innocent children wear their unabbreviated noses to this very day.

DISCUSSION.

Dr. A. L. Carroll, of New York county, thought the discussion of the fad question ought not to be done by him, but rather by the abdominal surgeon or gynaecologist. He thought fads were very desirable things from a commercial point of view. Just as a man always comes when

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circumstances arise that demand his services, so fads come when it is necessary for the young practitioner to increase his income. Unquestionably we have a number of new fads, most of which Dr. Didama has intelligently and seriously considered. There are other new fads that belong almost exclusively to the gynaecologists, neurologists, rhinologists. In gynaecology we had, under the late Dr. Marion Sims, the fad that it was necessary to divide every cervix. The existing generation of gynaecologists are busily employed in sewing them all up. In abdominal surgery we have normal oophorectomy. He would like to enter a caveat at the present moment for a normal splenectomy. We know that in malarial trouble the spleen becomes enlarged. He thought that there was reason to suppose that if the spleen were extirpated typhoid fever would be impossible.

There is another possible speciality which might be worth five thousand dollars a week to an enterprising surgeon. He would suggest that immediately after birth the appendix vermiformis be removed. The appendix is of no apparent use except to create cases of abdominal surgery. Nothing has been said of filling a patient with hydrogen gas and then lighting him. Of course it is an admirable method of determining if there be any perforation. But all these are fads; and fads show the immense progress we are making in the mental equipment of our profession.

Dr. S. T. Clark, of Niagara county, said that Dr. Didama had misinterpreted the expression of his countenance when he thought he desired to say anything on this subject. There was little more to be said.

Dr. Didama had often delighted the Association by his observations. To-day he had professed to be unscientific, but had presented an extraordinary piece of scientific work, for there is no way in which error can be better corrected than through ridicule. If the people of these United States could read one tenth of this paper, they would learn something of the various methods by which they are imposed upon and robbed of their hard earnings: and he hoped that it would be generally read, for it contained the germs of much true science.

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SOME OF THE USES OF THE TEMPORARY-TRANSFIXION LIGATURE.

By Thomas H. Manley, M. D., of New York County.

In the whole realm of surgery there is nothing more appalling than the presence of alarming haemorrhage. As a subject of study, haemorrhage ranks in importance second only to the antiseptic treatment of wounds. But, strange to say, while the technique of operating and treating wounds has undergone much important modification and improvement, the management of haemorrhage has not kept pace with these advances in the surgical art; and with the exception of the Esmarch bandage and the clamp forceps, little progress has been recently made in this direction.

In 1870, Sir James Paget, speaking of what had been accomplished up to that time, and of what might be accomplished in the future, in the treatment of aneurism, said,—"In our own time progress has made such rapid advances that the mortality, which, under the system praised by Mr. Hodgson, must have amounted to a large percentage of those operated on, is now very much reduced by the invention of instrumental compression; and even this will no doubt soon be further reduced by the more frequent use of flexion and digital pressure." Continuing, he said,—"A century hence, we may hope, our descendants will have as valid a reason to boast of improvements upon the science of Watson and Latham, as we have to congratulate ourselves on our advances upon the doctrines of Pott, Larry, or Crampton."

Little did this distinguished author and surgeon imagine that, at the very time he was making this prophetic forecast in London, Lister, in Edinburgh, was conducting a series of experiments which have since revolutionised the surgery of the whole civilised world, and in no particular more manifestly and salutarily than in the control of haemorrhage

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The elastic bandage was at that time in use in Germany, and the problem of dealing with bleeding in the extremities was solved; but the question of devising a plan for the more effectual preventing or controlling haemorrhage in other regions of the body was yet unsettled.

Since the dawn, however, of antiseptic surgery, and the present advancement of our knowledge of the histology, physiology, and pathology of the blood-vessels, surgeons perform successfully operations which, within the recollection of us all, would have been regarded as reckless mutilations, and condemned as almost never justifiable.

With the fear of infection banished from his mind, and with a good knowledge of practical anatomy, the ingenious and intrepid surgeon of to-day hesitates not, when conditions require it, to open into almost any part of the body. A similar freedom of fear of haemorrhage would greatly enlarge the field of justifiable operation. But before describing the temporary transfixion-ligature, which has proved of value for this purpose, it seems desirable briefly to review the methods now in use for the arrest or control of haemorrhage.

Pressure, as a ready means of stopping haemorrhage, is very ancient. Dr. Hodgson tells us that the Greek and Arabian physicians, more especially Ætius, Paulus of Ægina, distinctly and emphatically recommended the application of the ligature on the vessel for the stoppage of blood in wounds and aneurisms, many centuries before the time of Paré, Hunter, or Anel. The same author also tells us, from the most authentic sources, that though Ambrose Paré applied the ligature on the bleeding artery in 1550, it was practised long before that time, but had fallen into desuetude, until its application was revived and extended by that distinguished surgeon. He further states, referring to John Hunter, that though he was the first in modern times to successfully treat aneurism by the deligation of the artery, it had been done frequently by the great Grecian physician Praxagoras, and others, long before the Christian era.

It appears that in the time of the early anatomists it was

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considered immaterial whether or not a vein was included within the ligature, their only care being not to include other tissues than the vessels; and it seems quite clear from the writings of Paré that he never thought of dividing the serous coat of the vessel with the ligature. He only insisted that great care must be observed in drawing the knot not to strangle a large nerve-filament, as he taught that this mishap, by reflex irritation, would cause tetanus, or a most painful spasm of the muscles.

Hunter, in his original operation for closing the popliteal artery, tied that vessel in the groove of the adductor longus muscle, where the vessel curves behind the knee. He always used thin tapes, and never less than three with two or three in reserve, thrown over the vessel above and below the point of ligation.

Scarpa, more fully realising the object in view, and having a wider comprehension of the physiology of the circulation, secured the vessel with one ligature only, at a point near its emergence from the abdomen, just below the origin of the profunda.

Acupressure—the transfixing of tissues, including the vessel, with a pin—has sometimes been employed in the past, and even to-day is successfully used for closing the superficial veins of the extremities and the vessels of the scalp. It, however, never came into general use, owing to the danger of infecting deep tissues, producing erysipelas, purulent inflammation, or gangrene. These possible accidents more than counterbalance the occasional good realised from its employment.

Many and varied have been the methods adopted for moderating or temporarily shutting off the arterial current,—postural pressure produced by flexing the limb, digital and instrumental pressure, and latterly pressure *en masse* by Esmarch's bandage.

The appliance most generally used until lately for closing the lumen of a large arterial trunk was the tourniquet. Like the elastic bandage, it answers well for the distal portions

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of the extremities, where the vessels pass over bony ridges, and can be compressed; but in other situations it is of little avail.

Digital pressure acts on the same principle, but is not so apt to injure surrounding parts, and is intermittent. It has been very often, and successfully, employed by the Dublin surgeons, who first called the attention of the profession to its efficacy as a preliminary and precautionary proceeding for producing full dilatation of all the anastomotic vessels of a limb, prior to closing the main artery with the ligature.

It is now something more than twenty years since von Esmarch gave us the elastic bandage. Its generally successful use completely upset the theories and notions of physiologists and surgeons at that time. Esmarch, totally disregarding the warnings and teachings of that period, with reference to the vessels which would not bear compression, etc., commenced at the extremity of a limb with his rubber ligature,—for such it really is,—and, including all the tissues within its rigid embrace, squeezed out the contents of every vessel, and completely stopped the circulation as he moved the constricting band towards the trunk.

Next to the antiseptic treatment of wounds, this modern plan for the control of haemorrhage has been foremost in revolutionising the technique of operations and saving human life. Its successful application has demonstrated that the vascular system will bear with remarkable impunity a vast amount of bruising, laceration, and stretching without its vitality or integrity being seriously impaired.

That the tissues must be fairly healthy, and the vessels free from atheromatous or organic changes, to endure with safety the firm, harsh grip of the rubber bandage for many consecutive hours, needs no proofs. When we bear in mind the agonizing pain which the conscious individual suffers when the rubber is applied, it can hardly be questioned that its use must not infrequently be followed, sooner or later, by serious disorganisation of the tissues within its tight embrace.

There are many situations in which the elastic bandage is

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wholly inapplicable. It can be of no service in amputations at the hip or shoulder-joints, in the regions of the great cavities, or in wounds or operations about the face or neck. It should, in order to do the least harm, be applied by an experienced hand. It is more apt than the tourniquet to be followed by secondary haemorrhage. The bandage being composed of rubber quickly deteriorates, and this is a very serious objection where its use is only occasional. Another objection to it is, that while applied it cuts off every kind of circulation beyond the point of constriction, and for the time every source of nutrition for the tissues. There is a chance, also, that the smaller vessels and capillaries may be so plugged with thrombi that perfect circulation in them never becomes completely reëstablished.

Next to pressure upon the vessels, a plugging of them by the coagulation of the blood is the most common and effective process in arresting haemorrhage. Though it has been demonstrated by distinguished investigators that coagulation plays but a subordinate part in the immediate closure of a vessel of large size, when the ligature is applied, still as one of nature's haemostatics it occupies a position of paramount importance. In capillary bleeding, venous oozing, and in slight wounds of the smaller arteries, this spontaneous solidification or thickening of the blood itself will prevent its farther escape. We are occasionally apprised of the great danger to life which a trivial wound may be in one whose blood is wanting in this property.

The real chemical or vital processes involved in the coagulation of the blood are but very imperfectly, if at all, understood by physiologists. The physical and chemical processes connected with it, when occurring outside of the vessels, have been explained, along with certain conditions which modify it; but the questions of the cause of this phenomenon, —how the coagulation is effected in the living vessel, and what the changes in the circulating fluid which occasion it are,—remain unanswered.

How long does it take a coagulum sufficiently firm to be

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a permanent barrier to the blood current to form, after the healthy vessel is constricted in its continuity by pressure or deligation? It is indispensable that this question be most carefully considered before deciding on the merits of the transfixion-ligature, and I shall recur to it presently, when giving the results of some experiments on animals to determine the effects of temporary ligation of the vessels.

The first occasion on which I had recourse to the transfixion-ligature to arrest haemorrhage was in the treatment of the following case:

Last winter a young woman applied at the Harlem hospital to be operated on for the removal of several large strumous glands, which occupied a large area below the ear and angle of the jaw, on the right side of the neck.

After making a long, free incision on a line with the mastoid muscle, the capsule of the most superficial gland was reached. There was no trouble until the last and most deeply seated gland was reached. Its outer or convex surface was easily denuded and freed, but its base and borders were bound down by tough, old adhesions of a leathery consistence. By keeping close to the gland, however, and tearing away rather than cutting the adhesions from above and laterally, it was almost entirely liberated, a small portion only of the base remaining. This was being teased, and lifted out partly with the aid of the dressing-forceps in tearing and detaching, and the scissors in snipping; and it seemed all but cleared when there was a sudden gush of blood. It came with such force, suddenness, and volume that in an instant it seemed to cover everything. The wound was quickly packed, and pressure exerted, but still the blood came filtering through the meshes of the gauze as through a sieve. The patient's features became deathly pale, her eyes began to roll and the facial muscles to twitch. An assistant pressed firmly upwards against the cervical vertebrae, and I removed the gauze and clamped up everything that I could seize, for no leaking vessel could be seen; but it was of no avail, the blood came pouring out, and it seemed that in a few minutes all would be over.

Crowding the packing down again temporarily to stay the tide, a thought came to my mind, and, seizing a needle-holder which lay near by, armed with a long, rather sharply-bowed needle and strong silk ligature, I passed the point of the needle deeply into the tissues, above the point of incision, on a line with the thyro-hyoid membrane, and carried the point sufficiently low to pass under and around the great vessels of the neck—arteries and veins; then making a sharp turn I brought the point out through the middle of the sheath of the mastoid muscle, and

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quickly tied the ligature, constricting the whole included mass. The effect of this procedure was instantaneous; the haemorrhage was controlled. It was clear, from the congested state of the veins of the face, and the total absence of pulsation in the temporal artery, that the ligature had passed under and embraced both the internal jugular vein and the common carotid artery.

The remaining portion of the tumor was now detached, the wound well irrigated, and the line of incision closed with the continued catgut suture. The young woman rallied well. The day after the operation the knot on the transfixion-ligature was opened, when everything was found doing well. I took the precaution of using the slip-knot, with long, loose ends, so that if haemorrhage should recommence on its release, it could be easily tightened without disturbing the tissues.

At the third dressing, about forty hours after the operation, the silk was withdrawn; and the patient was dismissed, with the wound firmly healed, on the tenth day.

It was most gratifying to me to hit on any sort of contrivance to promptly arrest haemorrhage in an operation where many well known and skilful surgeons have seen their patients bleed to death without being able to save them.

The elder Gross, Dr. Wyeth, and Dr. Briggs, of our own country, with Cooper, Valpeau, and Langenbach, of Europe, all report cases in their own practice which succumbed to haemorrhage occasioned in removing tubercular masses from the neck.

In view of the success of this first trial, it occurred to me that, in conjunction with the modern antiseptic methods, the temporary transfixion-ligature might find a wide application. A fair estimate of its value and its range of application, however, could not be made without a series of investigations and dissections on the cadaver, for the purpose of studying the topographical anatomy of those regions in which transfixion by ligature seemed expedient. After applying the ligature over various vessels, I dissected down on it, closely observing the different tissues pierced or mutilated in the passage of the needle.

I commenced, in December, 1888, a series of such dissections on the human body, beginning with the arteries of the lower extremities.

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I applied the ligature with ease to the posterior tibial artery, where it curves behind the internal malleolus. In cutting down upon the ligature, I found it embraced, among other structures, the posterior tibial nerve and the tendon of the flexor longus pollicis. Inserting the needle again under the anterior tibial or dorsalis pedis artery, to the inner side of the extensor muscle of the great toe, just below where the vessel emerges from under the anterior annular ligament of the ankle, I brought out the point within an inch of where it entered. Dissecting down, it was discovered that the ligature had penetrated the anterior tibial nerve, and one of the venae comites, besides the tendon of the extensor longus digitorum. I next essayed the inclusion of this vessel just below the insertion of the quadriceps tendon (ligamentum patellae), when I at once saw that in order to bring the steel pilot under the vessel I must carry its point down close to the surface of the bone. On dissection, I found that the needle went safely under the artery, and came out without touching the nerve; but owing to the deep situation of the vessel here, I had to employ a longer needle, and include considerable muscular tissue.

My next venture was with the popliteal artery. This vessel, with the large number of branches which it gives off in the popliteal space, the large terminals of the sciatic nerve, the confluence of the popliteal and tibial veins and the venae comites, and the narrow, shallow form of the space, all conspired to make the successful application of the ligature very difficult, and liable to injure important structures.

I selected a long, slightly curved needle, firmly secured in a needle-holder, and sent it about an inch downwards, until the bony surface of the femur was felt. I then made a sharp, curvilinear movement, carrying the needle's point on the external aspect of the limb. The needle entered very near the apex of the space where the fleshy substance of the hamstring muscles begins to taper into tendon. On dissection, along with other structures, the popliteal artery, vein, and nerve were found within the silk. A few small veins and articulating branches of the artery had been lacerated by the needle in its transit. A few fasciculi of the outer head of the gastrocnemii, with portions of adjacent tissues, had been punctured, the needle emerging through the tendons of the biceps and vastus externus muscles.

Scarpa's triangle was next sought, and efforts made for the ligation of the femoral artery. This time, in trying to secure the vessel without taking up too much muscular tissue, I passed the needle through the femoral vein. With a longer and more sharply curved needle, and by first forcibly adducting the limb, on the second trial I succeeded in getting under both vein and artery. The vein is very deeply lodged above the hiatus in the fascia lata, but where it lies on the ridge of the os pubis it is more superficial. Immediately below this point the vessels are readily ligatured in spare individuals.

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I have tested the efficacy of the ligature in castration. I take up the spermatic cord, feeling for and separating the vas deferens, then pass the needle and silk through, and tie everything firmly. When applied, it permits no retraction of the cord till all the vessels are separately and securely tied and the operation completed.

Having demonstrated on the cadaver the possibility of applying the ligature to most of the larger arterial trunks of the extremities, without apparent serious injury to the structures invaded, I extended my experiments to the neck. I fully appreciated the magnitude of the issues involved here in the event of accident, though it was undoubtedly with the deep, internal jugular that I had to deal when the transfixion-ligature was first successfully applied.

In critically considering the circulation in this situation, we are at once impressed with the number and size of the vessels, and their complex and intimate relations to vital structures. Between and closely connected with the numerous vessels in the neck are the cranial, cervical, and sympathetic nerves. After arming the needle-holder with a rather long needle, well bowed, I seized the larnyx with the left hand and pressed it toward the right. The point of the needle was sent directly downward, following closely the border of the thyroid cartilage, till I felt assured it was on the floor of the space occupied by the internal jugular vein, on the anterior surface of the rectus capitis anticus major muscle, when the needle was made to describe a sharp curve, the point coming out through the integument two and one half inches from where it entered.

On dissection, the ligature was found to include the following structures: The skin, the platysma and the posterior, or concave border of the omo-hyoid muscles, the ascending pharyngeal artery, the rectus capitis anticus major for about one third of its thickness, the scalenus anticus and a few fibres of the sterno-mastoid muscles, the vagus, spinal accessory, and part of the sheath of the second cervical nerves, the common carotid artery and internal jugular vein lying near the central part of this constricted mass. I repeated this experiment on both sides of the neck in three different subjects, with substantially the same results.

It was evident to me, from these experiments, that the application of the ligature in spare built subjects just below the bifurcation of the carotid was not very difficult or dangerous, though as the vein usually lies farther away from the artery as it approaches the sternum, the application of the ligature low down in the neck might be attended with danger. Though its use must always involve more or less risk when we approach the angle of the jaw, yet in an emergency attended with immediate danger to life from haemorrhage, and without other appliances within reach, I would not hesitate a moment in adopting the method under consideration.

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As I had applied the ligature during the past winter to the facial, temporal and coronary arteries, with their branches, on the living subject, I had no need to do experimental work on that part of the cadaver. It now remained to deal with the upper extremity.

I began in the axilla with a view of taking up the brachial artery as it passes over the border of the latissimus dorsi muscle at its humeral insertion. Here the procedure was much simplified and more easily executed by raising the arm to a line parallel with the axis of the body, and slightly rotating the shoulder outwards. After a careful survey of the landmarks and the relation of the vessels, I fixed a medium sized bowed needle in the needle-holder, the shaft of the needle being held at right angles to the handle, and passed the needle's point from within outwards, close to the outer margin of the insertion of the pectoralis major and the inner border of the biceps, keeping close to the shaft of the bone till I felt assured that the needle had passed under the vessels, when a quick, arching motion was made, and the needle brought out three inches internal to the point of introduction.

On dissection, I was gratified to find that in carrying the silk around the large vascular trunks, no important parts had been lacerated. The ulnar nerve alone had been partly torn on its under surface. On other subjects I was not so fortunate. In one instance I transfixed the median nerve, and in another pierced the cephalic vein.

The brachial artery, where it slips under the bicipital fascia was next ligated. In this situation the ligature of the vessel is a very simple matter. The basilic vein and the integuments can be drawn slightly to one side, the needle entering close to the inner border of the vein till the osseous surface is felt, then brought out by the same quick, circular movement of the hand. My first transfixion at the elbow was attended with laceration of the median nerve. In my second and subsequent efforts, by introducing the needle a little further from the vessel, the nerve escaped injury.

From my experiments, I am convinced that the ligature may be safely and easily applied to any healthy vessel, wherever situated.

The next step in the experimental study of the effects of temporary ligation of the vessels was to determine the length of time a vessel might be obstructed without causing a coagulation of blood within it or its branches, and the injurious effect of such transitory pressure upon the nerves. For this purpose experiments were made on living animals.

A medium sized dog was etherised, and the ligature carried through the tissues, close to the windpipe, around the vessels, and then tied. Blood oozed freely along the ligature for a minute or two, and then

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ceased. Immediately there was well marked congestion of the conjunctiva on that side, and the tissues lining the mouth were also deeply congested. The carotid ceased to beat above the point of ligation. The animal was allowed to come out of ether, and four hours later was examined. Although the ligature completely arrested the circulation in the artery, it was apparent that the collateral vessels had reëstablished a current, for the congestion had passed off; and except for some slight uneasiness which the silk caused the animal, there was nothing unusual about his appearance. The ligature was then cut and withdrawn, the artery above the constriction immediately filling. The dog ran about the next day in his usual health. I repeated the same operation on the same dog on the other side a few days later, with the same results.

After he had recovered from these experiments, I first compressed and then divided the vagus nerve in the carotid sheath. I did this to estimate the effects of nerve-injury which might possibly be inflicted by the transfixion method. Immediately on section of the nerve the heart was thrown into the most tumultuous action, and the respirations were more than tripled in frequency for a few minutes; but equilibrium was restored within half an hour, and a day or two later the dog was as well as ever.

In the dog, the ligation of the femoral and brachial arteries by the transfixion-ligature is very easy, there being so little fat that they are easily reached. I have left the ligature on four, seven, and twelve hours, and in every case, on freeing the vessel and removing the ligature, the distal portions of the arteries at once filled with blood.

There can be no doubt, in these experiments on the dog, that the veins were occasionally wounded; but they quickly closed, and there was no evidence of injury to the nerves from long and continued pressure, as neither sensation nor motion was in the slightest degree impaired, as far as could be observed.

Though in the dog the circulation is not so rapid nor the blood so coagulable as in the human being, yet a fair estimate can be made from these experiments as to the range of usefulness and safety of the ligature. Without the very modern discovery by Lister, it would be wholly inapplicable as an agent for the control of bleeding, and would be always fraught with danger.

It was only quite recently, also, that it was proven that the healthy vein is not so liable to take on inflammation from a slight trauma as was formerly supposed; and it was left for von Esmarch to demonstrate to the profession the vast

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amount of long and severe tension which the veins can safely sustain. The successful use of the hypodermic needle, which antedated the application of antiseptic principles, also demonstrates the impunity with which tissues may be injured without lasting ill effects.

In taking up deep trunks or vessels under thick layers of fat, one must have a reliable needle-holder, although in easier cases a simple needle and thread will suffice. It is of the greatest importance that the ligature be rendered thoroughly antiseptic, and the parts to be pierced be entirely aseptic. Silk thread should always be preferred, if circumstances permit a choice. Being applied only as a temporary expedient, its strength and non-liability to slip or stretch give it advantages over other ligatures. Silver wire tears and corrodes. Catgut, when used in my experiments, relaxed after two or three hours to such an extent as to permit the circulation to become partly reëstablished.

A most important part of the apparatus is the needle. It should be made of well tempered steel, spear-pointed, and bowed according to the special region to be explored,—the deep vessels requiring a long, obtusely bent needle, and the superficial ones a short needle with a rather sharp angle. The shape and length of the needle are of infinite moment, but experience alone can guide the choice in each particular case.

The needle-holder makes the insertion of the needle much easier than when the naked finger and thumb are used, but caution must be exercised, as the tactile sense is less acute.

The operator must, of course, have a good and practical knowledge of anatomy, for he must mentally and clearly outline the course of the vessels to be compressed, and their relations with adjacent parts. The needle is passed in on as near a vertical line as possible, and sent down perpendicularly until it is reasonably certain that the level of the vessel is passed, when the heel of the needle is quickly made to describe a segment of a circle at as sharp an angle as possible, in order that the needle's point may reach the surface again,

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embracing as little of the tissues as possible. The venae comites must always be included with the artery.

As an arterial vessel of large size is very movable, and rolls about under any sudden disturbance of the tissues, it is important to fix it with the finger of one hand while the other is performing these manipulations.

In applying the ligature to the femoral or brachial artery near the joints, the limb must be well rotated outwards and adducted. This movement brings the vessels nearer the surface, and insures their ready ligation.

When I first employed the ligature, I secured it with a sliding knot, and released it when necessary by drawing on the free ends, but I found the projecting ends in the way. If it appears, when the needle is introduced, that a vein of considerable size has been punctured, I withdraw and reintroduce the needle further down, taking care the second time to go deeper, and include more tissue.

As illustrations of the use of the temporary transfixion-ligature, I cite the following cases:

On the 20th of May, 1889, for the first time I temporarily transfixed the tissues for occlusion of the femoral artery, in an amputation at the hip joint. The patient was a rather fleshy female. Owing to the immense thickness of fat over the line of the vessel, its pulsations were very indistinct, and I was loath to transfix *en masse* through so much adipose tissue. Accordingly I modified my plan somewhat, as we must in all operations under peculiar circumstances. After commencing the oval flaps, I dissected them back for an inch or two. The arterial pulsation could then be plainly seen, as the vessel was quite superficial.

At this stage the needle was introduced close to Poupart's ligament and the point carried down close to the bone. The ligature was composed of heavy, braided silk, doubled. The needle was now, after its emergence, cut free from the ligature, and everything within the latter slowly but firmly compressed till the femoral pulse ceased. A reef knot was then tied, the free ends of the ligature snipped off, and the amputation proceeded with. On its division, the femoral artery was found empty of blood, and there was no haemorrhage except some slight spurting in the gluteal region.

The operation was almost bloodless. I was not encumbered or annoyed by the use of any kind of tourniquet or elastic bandage, which, at best, are more or less in the way, and always liable to slip; nor was the

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attendance of a reliable assistant necessary to compress the vessel. The blood-supply was completely under control, as I could at any moment remove the pressure on the blood-vessel.

After the limb was disjointed and severed, the gaping, open mouth of the artery was closed, the ligature being applied to its denuded external coat with sufficient tightness to divide its serous tunic, and when it appeared that all haemorrhage was controlled, immediately before closing the flaps the temporary ligature was cut.

It was interesting at this time to see with what alacrity the lumen of the vessel filled, and feel the rebound with the bare finger as the circulating fluid came against the end of the vessel.

The patient's recovery was uneventful. The wound healed kindly, and she left the hospital six weeks later with a shapely and comfortable stump.

A male patient entered the hospital in April, with an epithelioma of the lower lip. The removal of those growths, as all know, is quite a simple operation, when only a limited area of tissue is involved, though any cutting through this spongy, vascular mass is often attended with loss of blood, which can be badly spared if the patient be anaemic. Much haemorrhage, also, interferes with the surgeon's movements, and intelligent assistants are needed to restrain it. We are warned by distinguished authors that when doing an operation for the excision of those cancerous ulcers, we must be cautious not to too deeply anaesthetise, as the blood which flows into the mouth may either occasion suffocation, or set up bronchitis by entering the bronchi if the sensibility of the glottis be blunted.

In our case, we first injected subcutaneously about the growth twenty-five drops of a four per cent. cocaine solution, when our patient walked into the operating-room and sat in a chair. The tissues now being well anaesthetised, a needle with double ligature was passed through the lower lip, close to the angle, half an inch below its vermilion border, from within outwards, and firmly tied. The same was done on the opposite side. With the patient sitting up, looking on, an orderly steadying the head, I leisurely cut away the diseased mass. There was not a drachm of blood lost, as none came from any source except the smaller veins and capillaries.

The divided tissues were brought together in the usual way, and then the temporary ligatures were cut and withdrawn. It is clear that with this means for the control of haemorrhage the practitioner can do this operation alone. For instruments he needs only a good scapel, with a needle and a little silk.

A police officer cut his wrist severely with glass from a broken window, which he had smashed while drunk. Both the ulnar and radial arteries,

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with several of the tendons of the wrist, were divided, and the vessels were bleeding copiously.

I had an Esmarch bandage with me, and though there were several people in the room they were so sickened and horrified at the presence of so much blood that no one could give me the slightest aid. Under the circumstances, it was altogether out of the question to try and find the retracted, deeply buried arteries, and this seemed to me another ideal case for the temporary transfixion-ligature, which seemed just the thing to close the vessels till I could procure the services of a professional brother to assist me in applying a permanent dressing. I took a short, sharply-bowed needle, armed with small, strong silk, and passed it a little above and below where I presumed the retracted mouths of the arteries were, securing each divided end separately. I used no needle-holder. The ligatures more than fulfilled my expectation, as the haemorrhage was at once and completely controlled. The wound was now thoroughly washed, and wrapped up in antiseptic cheese-cloth, and the arm put in a sling.

An hour later Dr. W. H. Rassman, the family physician, assisting, with a little cocaine applied, I laid bare and ligatured the proximal and distal ends of the radial and ulnar arteries. The wound healed well, and the patient made a good recovery. In this instance the ligature gave an opportunity to apply antiseptic dressings, and to secure skilled assistance.

In doing a herniotomy last March in a badly illuminated room, at midnight, I accidentally divided the internal epigastric artery. The field of operation was immediately covered with blood, and owing to the extent of retraction of the ends of the vessel into the tissues, I failed to secure them. The needle was again called into requisition, this time fixed in a needle-holder. It was pushed right through the tissues under the artery, and tied tightly on the surface of the integuments. The spouting vessel was at once subjugated, and haemorrhage ceased on the drawing of the knot. After the strangled bowel was returned, and the final stage of the operation reached, the mouths of the vessel were sought for, and secured with fine, strong catgut, and the temporary transfixion-ligature removed.

This has been the extent of my experience with this method in closing the arteries in the living human subject. The ease, simplicity, and success with which it has been applied, I think justify me in claiming for it a very extensive range of application, and warrant my strongly urging its general adoption in the surgery of the extremities, the cervical region, and parietes of the great cavities, under many circumstances.

In amputations through the joints I am certainly unac-

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quainted with any other device by which a great vessel can be so effectually, and at the same time only *temporarily*, closed without injury to its structure or integrity, and which does not require a cumbersome, unreliable apparatus for constriction and assistants for its management.

I greatly regret that I did not have a shoulder joint amputation, in which to demonstrate, in this situation, its advantages over all other methods of controlling haemorrhage. In such a case the ligature would be applied high up, the deltoid flap detached, the joint unlocked, the long blade of the knife coming out *below* the point of transfixion, dividing the bloodless artery in its course. Little blood would be lost except from the terminals of the supra-scapular, and the articulating branches of the axillary artery; but that trifling leakage would be of little consequence, ceasing on adjustment of the flaps.

I am aware that it will be objected that we may lacerate or send the needle through the walls of an important vein, thereby impairing its future integrity, or possibly excite a phlebitis which may put the patient's life in jeopardy by septic contamination. But I answer, that I recommend this bold departure only with the presumption that antiseptics will, in every instance, be applied with the greatest rigour, without the smallest detail being omitted; and, further, that it is of no consequence even if a vessel is wounded under those circumstances, for with the dissevering of the limb it is thereafter forever functionally useless, atrophy and obliteration quickly following.

If surgeons will give the plan here outlined a fair trial, without any preconceived bias or prejudice, I feel sanguine it will promptly attest its many merits, and shortly take a recognised place in the *Armamentarium Chirurgicum*. In the hands of the general practitioner, without an elaborate supply of instruments, away from any centre where assistance can be had, this method of controlling haemorrhage may have a happy application; and in battle it may be the ready means of saving many lives.

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This ligature may also be applied with advantage in cases of bleeding caused by the rupture of a vein, as in a varix, in wounds or incisions of the neck, in the vicinity of the superficial jugulars, when through pathological changes these vessels, on division, do not collapse, but have become rigid and distended, a condition known to surgeons as canalisation.

As a prophylactic measure, under these circumstances, in operations on the neck, when the admission of air into the cardiac cavities is dreaded, it is well first to close the lumen of the vessels with the ligature before cutting.

As to the efficacy of this ligature in the treatment of aneurism, looking at the histological elements of the artery and its pathological changes, I feel assured that there is here a wide field for its use. For traumatic or dissecting aneurisms it applies as in amputations. In aneurism resulting from disease, it seems to merit a trial.

The almost insurmountable difficulties in the way of treatment of those pulsating tumors are well known. The degeneration and disintegration of the vessel walls, with calcareous changes, are such that, with the ligature drawn firmly on the bare artery, its brittle, rigid coats quickly give way, and fatal haemorrhage follows. So fearful were the earlier occurrences of this catastrophe that surgeons always interposed bits of linen or doeskin between the ligature and the vessel before ligation was completed. We find Hunter attaching much importance to this detail, and he was imitated by Boerhaave and Anel. I am inclined to regard the advice as sound and practical. The great object in view, in the management of aneurisms, has been to secure the coagulation of the blood within the sac. Surgeons have sought to attain this end by a great variety of methods, but their main reliance has been on pressure, moderate or severe.

Although no opportunity has yet presented itself to test its adaptability in some of those cases, I am confident that the ligature will prove of considerable value here. Any kind of pressure which will divert the blood into other channels will favour the closure of an aneurismal sac. Now, the trans-

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fixion-ligature obviates the difficulties encountered with immediate deligation of the vessel or pressure by Esmarch's bandage. In the former, the vessel is compressed tightly with the knot, and the inner coat severed; while with the latter every kind of circulation is cut off, and everything beyond the rubber is pretty liable to perish. With the temporary ligature the main trunks only are included, and the tension of the silk may be so adjusted as gradually to compress the lumen of the vessel without crushing it.

With small, superficial aneurisms it seems certain that it would work admirably, cutting off the morbid blood-supply without compromising neighbouring tissues. Here its action is similar to acupressure, which was strongly recommended in minor aneurisms by Anel and Delpech; but it fell into desuetude owing to the fact that ulceration and erysipelas often followed its use,—something in these days of antiseptics quite impossible.

I have introduced this method as an accessory to others now in vogue, and not with a view of recommending its substitution for others which have stood the test of time. There are occasions when any given method will fail; and so with the transfixion-ligature, occasions will arise which will prohibit its use. It should not be employed under the following circumstances:

1. In open wounds, when forceps are conveniently at hand, and no large vessel is divided.

2. In haemorrhage, which may be effectually controlled by digital pressure, or by a bandage.

3. In amputations at such a distance from the articulations that the tourniquet or the elastic bandage may be applied.

4. In those cases where the vessels are deep-seated, unless the parts have been horoughly cleaned and the material used is entirely aseptic.

The objections to its use at first sight seem formidable and numerous, but on a careful analysis of them they are not so great as they appear.

I am fully conscious of the incomplete and very limited

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range of observation which I have had, and the rather random and imperfect manner in which I have, in some instances, outlined the anatomy of the parts to be dealt with; but my aim has been, rather, to call attention to the subject, than to go minutely into detail, as this would carry me much beyond the scope of this essay.

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THE SHADOW-LINE OF INSANITY.

By JOHN SHRADY, M. D., of New York County.

The aim of the present paper is not to delve into abstrusities, but to deal with the palpable; to judge the subject by symptoms as one does the individual by his conversation or deeds. It only professes to take cognisance of the mental autonomy, as regards its health or disease, with the sole qualification that no man can be pronounced absolutely sound in either body or mind.

There are many just on the border line of insanity, whom the law wisely covers with its shield of individual liberty. Many have delusions,—harmless, amusing, and in no wise disturbing to the peace of the community. They may have compensating qualifications, which the world could ill afford to lose. They may be eccentric, and yet, comet-like, be brilliant. All communities have many such, and all communities are tolerant of them. Friends and relatives are somewhat on their guard against them; but their circumspection is unmixed with dread—they are merely intuitively careful.

Much depends upon early surroundings and training in the development of these cases. At one extreme of the manifestations of the mental twist is melancholia; at the other, mania. The self-depreciation of the one may end in suicide, the self-exaltation of the other in homicide. Between these two extremes there are many faint and shadowy interruptions,—many suspicions, but few facts; the law is too narrow to classify for either protection or punishment; it shifts the burden upon society, with the presumption that it is quite strong enough to bear it. The victims therefore go through the world, in it, but not of it. They are petted on account of their super-sensitiveness, or avoided for their churlishness. The world only does what is most convenient: it uses place-

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bos, or, at best, palliatives, because it cannot be brought to believe that the disease is serious. On the other hand, there is no great addition to the general misery, for the straw chaplet of the paretic king gives to its wearer more satisfaction than the jewel-bedecked crown of the absolute monarch. The Ego is all in all, the many-headed nothing; and thus self-convincement is never lost in self-conviction.

Some one has described insanity as incoherence of speech with intense mobility of thought. One in the exalted stage of inebriety, "O'er all the ills of life victorious," may be cited as the exemplar of this definition, provided care be taken to discriminate between the temporary and the continuous condition. The emotions are concerned in both inebriety and insanity: the will is but their slave, and reason the slave of that slave.

In the discussion of a subject, where definitions are so vague and unsatisfactory, much cannot be advanced. The vista is altogether in the retrospect. Some crowning act will explain away many preceding incongruities of speech and eccentricities, but lightly regarded at the time. The case, so to speak, has been made complete, capacity may not be impugned, or culpability proven, or responsibility fixed, and yet there is cause for indictment if not for punishment. It is these very cases that originate so much controversy and are the occasion of so much satire. Let some one hint that Samuel Johnson's periods of gloom were manifestations of mental unsoundness, and he will be tabooed as a carping, jealous critic; or that Charles Lamb, with his utter disregard of the future, participated in the insane taint of his family, and he will be confronted with the "Essays of Elia;" or that Cowper's attempted suicide was a fact in his biography, it will be ignored by quotations from "Gilpin's ride;" and so will doubts beset the genius of De Quincey with his inimitable rhythm of diction, Coleridge with his towering flights, Poe with his organ-toned melody of verse, and Charlotte Brontë with her introspective sentimentality. These are all instances of nature's departure from uniformity, society being the mechanism and man the

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unit. The exigencies of civilisation are responsible for the results, from the low ambition to supply the coarsest animal wants, to the attainment of what is conceived to be the highest pinnacle in the intellectual or moral world.

But what is to be the standard of the sane mind? Said the court physician, when questioned regarding the mental condition of King George the Third,—"Sire, no man is truly sane." Eliminating somatic causes, but little remains to be said in an affirmative way. And yet, ascending from the palpable to the impalpable, much may be gained by reasoning from analogy. Taking the system of Greek training as the type, a symmetrical development was the object of all education, whether mental or physical. The aesthetic rather than the moral was concerned; the individual rather than the community was the object of interest. If the Greek was moral, it was through motives of policy rather than from a sense of justice to his neighbour. Not until the school of Socrates became somewhat dominant did the Greek rise much above mere self. Here the line of beauty ran in its accustomed curve, but of course lost its force through want of directness. Here was the individual without exhausting neoplasms, not absolutely sound and yet able to pass muster among his fellows. Perhaps he might be called a good all-around man, capable of many ordinary acts where no special test of strength was required. Yet aggregate those individuals into a mass, and you have the great Greek nation, which erected the standards of taste in all the departments of civilisation.

The sane mind might be said to be one noted not so much for its stores, as for the arrangement of its wares,—not so much for its wealth, as for its capacity of acquisition. It is the material for the jury-box which the judge yearns after—the average standard of intelligence characterized not so much for its depth as for its impressibility, adaptability, and powers for the appreciation of analogy. Strength and soundness are not convertible terms.

What is insanity, and what is its earliest shadow? As a

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symptom, the delusions of grandeur must take the front rank, and these may rate from the grotesque to the dangerous. At one end may be the star of destiny of a Napoleon, at the other the lucky numbers of the policy dupe. Both types are confident in the special interposition of the higher powers; both that the work of the spheres is delayed, that their selfish cravings may be gratified. Still these minds without worldly wisdom are not without usefulness: their insanity veiled may quietly escape attention, while on its journey of life: they may even instigate reforms and add to the work of genius. They may sow, and others may reap.

The victim of the coarsest passions swayed from the coarsest crimes only through dread of a penalty, self-contained and self-impelled, with not an idea of responsibility, a savage king in his own right, claims but little of our sympathy. Yet he is merely an aberration of energy, a misdirected force which might be made to pay tribute to society, and which, barring the opportunity, might be incarnated into the leadership of a nation. It is these wild forces which it is the strife of nature to bring into an orbit. A Uriah Heep might become a Richelieu, a swash-buckler a crusader, a desperado a most intrepid soldier, nay, more, a burglar a stormer of batteries. These are but degrees of the same qualities needing only the discriminating intellect and the over-topping will. Some go through the metamorphosis more rapidly than others, and some stop quite short at a meagre development, their aims frustrated and their ambitions merged into a harmless contentment. These last are the happy-go-luckies of the country store, who play the clown and take their pay in the plaudits of a silly crowd. A bare pittance satisfies them, and the world gives them no more: it allows the kingship, but pays no revenue. Solomon could not equal their glory, any more than he could descend to their frivolity.

It is these over-emotional people who make the character they assume coherent by a logic of their own. They never forget the proper deportment in any of their rôles. One who has some pretensions to being an alienist, points to what may

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be called the logic of the insane. He says that after all they may be clear reasoners: granted, but is the fault as much with the logic as with the premises? The lunatic in his way is harmless enough, provided his delusions be not pernicious. His mission, as he may term it, grooves and dovetails well enough with his acts, whether he consider himself the mould of form, or the deputy of a spiritual power to remove an obnoxious ruler. To use a metaphor borrowed from the lapidary and passed into general use, he is off color, and suffers in his market value. He may be an enigma to judges without danger of conviction, or he may end his hours with a mock-heroic air upon the gallows, unrepentant and deploring a mis-carried mission.

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REMARKS INTRODUCTORY TO A DISCUSSION ON TREATMENT OF HERNIA.

By Joseph D. Bryant, M. D., of New York County.

Custom, in this Association, declares in favour of a formal discussion of some special subject of general interest. Fate decreed that it fall to the lot of the reader to outline and open the discussion, also to indicate those who have so kindly consented to honour and to enlighten the occasion with their presence and with the results of their labours. The treatment of hernia is the special subject that was submitted by "the powers that be" for our consideration; and now we, the writers, will submit the conclusions to your consideration, hoping that these conclusions will justify the previous action of the "powers," at least in some degree.

The subject, hernia, is an ancient one, and has associated with it the dust and traditions of the earliest times of medical and surgical matters. It can be safely assumed, I think, that the consideration of means of relief from this affliction was but a step behind the first occurrence of the affliction itself; and the age of the affliction is best measured by the length of the time of the establishment of the present relations of the abdominal contents and their walls with each other.

The person who had the first hernia was the first person to contemplate means of relief from it, and no doubt soon learned to seek the same relief in the recumbent posture, and from manual pressure, that these measures afford to-day. The mechanical treatment of this affliction had its inception, no doubt, at about the time that the first unfortunate sufferer had succeeded, after much labour and pain, in reducing a strangulated viscus. He appreciated at once that the abdominal contents must be kept in their proper places, and he had,

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without doubt, noticed the fact that the recumbent posture met this requirement; but to remain lying was then, as now, neither wise, pleasant, nor remunerative. To retain the viscus in the proper place by manual pressure while in the erect posture was recognised to lead to improvidence, to encourage impertinence, and to end in despair. It contemplated a too practical application of that good biblical maxim that teaches "Let not thy left hand know what thy right hand doeth." The use of bandages and soft compresses for the retention of hernial protrusions was recommended by Celsus, near the first century, and cures were claimed by him to follow their use, especially in young children. Galen confirmed the treatment of Celsus, and, about five centuries later, Theodorus Ætius emphasised the method and the results. Pads of wood and of iron, held in position by a non-elastic soft girdle, were employed in Italy in the thirteenth century. In the fourteenth and fifteenth centuries, Bernard de Gordon and Gatanaria advised the use of an iron girdle, which, however, was soon exchanged for the hard-pad and soft-girdle appliance previously in use. In the sixteenth century, Fabricius Hildanus devised a truss of flexible soft iron, which could be moulded to fit the form of the patient. It is said that to Matthias Major belongs the credit of having first employed, in 1665, a truss with an elastic steel spring. The time at my disposal will not permit me to dwell at length on the further development made in hernial appliances. In fact, it is hardly necessary, since it is now only requisite to attach the hard pad of the thirteenth century to the elastic steel spring of the seventeenth to form the substantial construction of the majority of the serviceable trusses of the nineteenth century. The greater number of medical men of the present day are blissfully ignorant of the truss armamentarium now in the market, also of the measurements, means, and method of fitting them properly to patients. The patients thus afflicted are relegated to the "instrument makers," or to other mechanical agents, for the proper truss and appliance, and the application of it. In a

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large number of cases, no doubt, this course on the part of the medical man is actuated by the sense of his own inability to meet the demands of the case. When this is the true cause, while we may commend him for his sincerity, still we must respectfully submit that he is a much too willing exponent of the sentiment that teaches "Where ignorance is bliss, 'tis folly to be wise." I will not say more on this point, but will avail myself of the privilege extended by law to those who are not required to testify as to matters that may criminate themselves. The consideration of the worth of trusses should contemplate the elements of the instrument that contribute to cure, to comfort, to convenience, to cheapness, and to durability.

That ruptures are cured by the proper use of trusses, there can be no doubt; but the number of substantial cures resulting is, unfortunately, small. It is impossible to estimate, with any degree of practical precision, the percentage of cures resulting from hernial appliances, since these appliances are commonly worn for the comfort and convenience they afford rather than for the purpose of a cure. Although it is proper to say that there are many trusses extolled for the certainty of cure, these, however, soon become associated with other things of a worldly character that contribute to heart-sickness by reason of "hope deferred." I have at this time under observation several patients who have worn trusses for two to five years by my direction, and they still continue to wear them by the same advice, although anxious in a few instances to lay them aside, because, as they express it, "it has not been down in months." It is, in my judgment, unwise to dispense entirely with the use of the truss, no matter how sure the patient, or even the doctor, may be of cure. In fact, the greater security lies in the judicious continuance of the use for patients who are certain of having recovered. Persons under twenty years, especially children, who wear the appliance faithfully, may expect to be markedly benefited, if not cured, when suffering from either form of inguinal, or femoral hernia of a reducible nature.

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The cure contemplated, however, is one that does not provide for all physical contingencies of human life. It is a cure in the sense that the structures may be then as able to withstand the effects of force as before the primary appearance of the hernia. It is a cure in the sense that the ordinary occupations of life may be safely followed, while all others should be feared to the extent of seeking a safe retreat behind the friendly support of the ubiquitous truss again.

It is my practice, when the means of the patient will permit, to advise the procurement and use of three different trusses,—one, intended for comfort, strength, and durability, for use by day; another, equally serviceable in other respects and impervious to water, for bathing; the last, for comfort and security during the hours of rest. The advantages arising from this course are obvious, and it is equally obvious that if due care be not exercised in changing these trusses, the anticipated benefits from their use will be lost. The establishment of the habit of assuming the recumbent position while making the exchange is the only simple and safe method of procedure.

The manner in which cure is accomplished by a truss is not as yet thoroughly agreed upon. It is, however, a most important matter to be decided, as bearing on the proper mechanism of the truss itself. Do trusses cure hernia by establishing adhesive inflammation between the serous surfaces of the sac? or by retaining the viscera in the normal position, thereby permitting the displaced and stretched tissues to resume, as far as possible, the normal relations with each other? or are both of these influences active in the cure? In my judgment the cures are rare where each of these influences plays an equal part in the cure. It is not my belief that adhesive processes are often excited within the sac by a hernial appliance. While it is no doubt true that in exceptional instances, by reason of the vigour of the appliance or the peculiarities of the patient, adhesion may be effected, still a method or means directly intended to accomplish this indication would "make the treatment worse than the disease."

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The occlusion of the sac appears to me to be due to contraction of that structure—a contraction dependent on the normal resiliency of it, aided by the friendly pressure of the contiguous surrounding tissues, caused by their return to the previously normal position. This contraction is of a uniform character at all aspects of the sac, as is indicated by the cord-like appearance of its remnant. If the obliteration of the sac were due to inflammatory adhesion incited by a peculiar variety of truss, then, indeed, the local symptoms incident to such a process and the outlines of the occluded sac would point to this change as the method of cure. I believe it is not too much to say that the tissue composing the sac, and also the tissues *around* the entire sac, will return to substantially their normal dimensions and relations when the distending and disturbing influences that have caused the change in them are long removed. If this be true, then the theoretical construction of a truss becomes quite a simple matter. The implement holding the pad in position should be elastic, and should exercise a degree of pressure sufficient to hold the truss in proper position, and at the same time exert enough additional force on the pad to prevent escape of the viscus. The pad should be of such a size and shape, that, while the force from it does not tend to open the channel of exit of the viscus, still it will prevent the insidious entry into it of the intestines or omentum for even a short distance. In other words, the pad should be slightly convex, and large enough to exert pressure some little distance beyond the border of the rupture. It should be hard, because a hard substance only will maintain the necessary relations just described. If it were soft, then the inequality of the resistance at the face of the pad, due to the existence of the separated and stretched tissues of the abdominal wall, would permit an inequality of the surface of the pad that would interfere with the return of the abdominal wall fibres to the normal relations. Furthermore, soft pads are less cleanly and less durable than the hard, consequently more irritating and expensive.

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It seems to me to be proper, also, to consider the effect on the contents of a hernial protrusion exercised by their continuous retention within the normal cavity. It is a fact that cannot be gainsaid, that the long-continued existence of omentum, mesentery, and intestine, even in a gradually enlarging hernial sac, causes stretching and a more or less elongation of the omentum and the mesentery, and possibly of the intestine itself. The elongation of the omentum, and of a limited portion of the mesentery, is surely familiar to surgeons who have had the opportunity to study the characteristic appearance of the contents of hernial sacs in connection especially with the attempted attainment of cure through radical means. It follows, naturally, if these tissues be retained within the abdominal cavity, that they, too, will again resume the normal proportions to a degree at least that entitles the hernial appliance to some favourable consideration in connection with the change.

The mechanical treatment of irreducible hernia introduces two additional aims, viz., support and protection of the protrusion. The protrusion should be so supported as to prevent further increase in the size of the protrusion itself, and also further increase in the area of the aperture of escape through the abdominal wall. A moderate upward traction on the protrusion is sufficient to neutralise the influences of gravity and other natural forces on it, and, in addition, to hold it gently against the abdominal wall in the course of the line of displacement. This condition of hernia ought always to be so protected as to obviate the dangers that ensue from the bad effects of traumatism. Neither time nor propriety will permit me to speak of the forms of trusses in the market. The medical man himself must judge between them, or from his inner consciousness evolve still another mechanism that equals or surpasses those already known. I will, however, submit the following conclusions to your consideration:

1. No form of truss yet constructed can be relied upon to cure any variety of simply reducible hernia.

2. The manner of the production of hernia, and that of its

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so called cure by mechanical appliances, are such that cure by mechanical appliances alone need not be expected now or hereafter.

3. Practical relief from the annoyance of a hernial protrusion may be had by the use of hernial appliances, which, however, ought always to be worn during all unusual physical efforts.

4. The so called cures from hernial appliances are dependent on the restoration of displaced tissues to the normal position, and to obliteration due to natural resiliency of tissues; not, as is often claimed, to the inflammatory adhesion of serous surfaces caused by special mechanical effects.

5. The hard, slightly convex pad, and the elastic steel spring attached, constitute the principal parts of the most philosophical, comfortable, cleanly, and durable of hernial appliances.

6. Suspension, elevation, and protection of irreducible hernial protrusions are the main indications for this mechanical treatment.

Not long since, Mr. Heaton, of Boston, employed and recommended a method of treatment for the cure of reducible herniae, which seemed at that time to offer to the afflicted of this condition the same ecstatic hope of immunity from it that the "Elixir" of Brown-Séquard incited in the credulous minds of frisky, though worthy, persons who had passed the "Rubicon" of life. Unhappily, however, for the latter class, the percentage of cure bids fair to be far less than that claimed for the former. I myself have had no experience with the "injection method," and do not now contemplate circumstances that will cause me to adopt this method of treatment, except perhaps in the young, and in cases of incipient herniae, when other methods are not deemed advisable. There are, however, with us to-day those who have tried the method effectually, and from them it is more befitting that statements should be received as to the efficiency of this method than from one who lacks experience, and can counsel only from theory. It is, at all events, certain

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that a more effective method of radical cure is to be found in connection with the various operative procedures of the present day than from the method by injection.

This leads to the inquiry, Which is the best method of treatment for the radical cure, the "open" or the "unopen" method? I know of no better way of determining as to the relative merits of any special method of cure of any special condition, than that of inquiring at once as to the indications to be met, and as to whether or not this or that special method complies the most fully with the natural demands for a cure. Let us take as an illustration a complete, simple, reducible, indirect inguinal hernia, and inquire as to the physical status of the affliction. (1) We find the internal ring dilated to permit the escape of the viscus; (2) the peritonaeum is elongated by stretching and growth to form the sac; (3) the omentum, the mesentery, and perhaps the intestine, are elongated by the continued traction incident to their escape. The internal ring of fascia, and the corresponding peritonaeum, are the first obstacles to the escape. When the viscus once enters the inguinal canal, the descent is not opposed by other than the tense elongating and enlarging peritoneal sac, the connective tissue in the inguinal canal, and the passive and varying pressure of the aponeurosis of the external oblique muscle, aided perhaps by the retentive influence of the elongating omental and mesenteric tissues. When once well in the inguinal canal, but little else obstructs the descent except the peritonaeum composing the sac, and the lax fasciae and integument of the abdomen. It therefore appears that the most substantial obstacle to the escape of hernia exists at the internal ring, and that when this is overcome, the formation of a complete hernia is merely a matter of time—facts which are confirmed by the clinical histories of cases of this form of hernia. From these statements, it appears that the chief aim for the accomplishment of a radical cure must consist in so strengthening the internal ring and contiguous parts, that escape of intestine is both opposed and defeated. Now, which of the two methods just

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cited, the "open" or the "non-open" method, better strengthens the internal ring? The method of Macewen is, it seems to me, as good an example of the "non-open" method of treatment as can be selected. At least, it is employed most frequently, is most strenuously defended, and is the best understood of the "non-open" methods. The method of Macewen occludes the peritoneal opening and strengthens the peritonaeum at the internal ring, first, by somewhat passive, afterward adhesive, closure of the neck of the sac; also by elevating the serous membrane at this point, or "bossing" it, as it is often called, and by diminishing the capacity of the inguinal canal at the lower portion by the approximation of the conjoined tendon and the external pillar. The "bossing" is occasioned by confining the "ruffled" sac between the peritonaeum and the fasciae at this point. The occlusion of the peritoneal opening presumptively converts the peritonaeum at this point into a nearly continuously smooth surface, when taken in connection with the contiguous peritonaeum, while the "bossing" is supposed to elevate the peritonaeum at the internal ring somewhat, to which elevation are assigned the functions of fortifying against and turning aside the internal visceral pressure at this the weakened point. Assuming that all that has just been described takes place, we can add still further support by including the strength of the recently divided abdominal tissues, united as they are by the sought-for primary union. That it is reasonable to assert, that closure of the neck of the sac does do it, as has just been stated, there can be no consistent doubt; but that the ruffling and placing of the sac itself, as is practised in this method, secures the "bossing" in many cases, is open to grave doubts. I am not aware that the occurrence of "bossing" has been actually demonstrated, but I am reliably informed that the reverse of the proposition has been noticed under circumstances calculated to demonstrate it. It is difficult, indeed, to understand how the "bossing" can be maintained, even if it had occurred at the outset, when the external support to the internal pressure at this point is

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much lessened from the normal by the absence of, or by the weakened and elongated state of, the usual supporting tissues.

So much for the physical state of the "non-open" method. Let us now conduct a similar comparison in connection with the "open" method. In this method the neck of the sac is closed by a ligature. The sac is then cut off, the aponeurosis of the external oblique slit up to opposite the internal ring, and the entire wound is caused to heal by granulation, care being taken to so treat the wound as to cause the cicatrix to reach up to and support the peritonaeum at and about the point of ligaturing, which is the weakest place. Other stitches are taken to modify the shape and size of the scar, but the grand *finale* is this,—the peritoneal structures are supported and fortified by a cicatrix, which occupies the inguinal canal, *and which it is thought will prevent the further escape of hernia, so long as the cicatricial tissue continues to exercise the peculiarities characteristic of its nature.* The integument and fasciae, too, are involved in this scar. In the "non-open" method the degree of the resisting influence exercised by the reunited tissues is also somewhat problematical, for the tissues, when healed by primary union, are capable of withstanding but little, if any, greater force than when in the normal state. The comparative resistance of normal tissue with that of cicatricial tissue is easily understood when the latter is noticed so frequently to draw the former toward itself, with the same grim certainty that the unsuspecting mariner is said to have approached the traditional maelstrom. My experience with the "non-open" method is limited to nineteen cases, but I regret to be unable to state the results after a period of sufficient length (three years) to enable me to form more than an approximate estimate of the worth of the method from my own experience. The majority of these (eleven) were hospital cases, all of which passed from my observation in from four to six months. Of the remainder I have no reliable knowledge, except in one instance of two years' standing,

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which is *still* cured. Suffice it to say, however, that so long as they were kept under my observation no return was noticed except in one,—a hospital case,—and this was within four months after operation. As to the "open" method, my experience is limited to five cases,[1] all but one

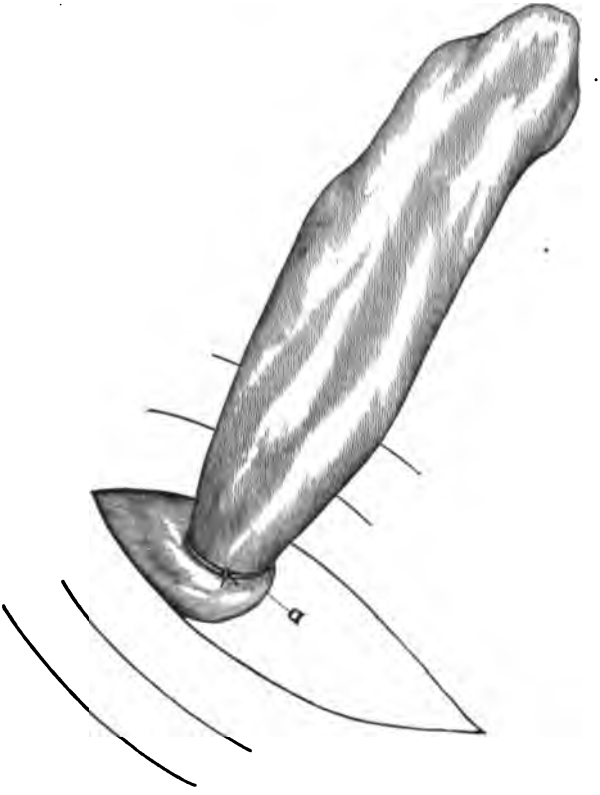

FIG. 1.—The Isolated Sac.

of which have been performed during the last year. In the winter of 1887, in a clinic given at Bellevue hospital, I treated a case of hernia for radical cure by the open method, in all practical respects. The wound was packed with

[1] Since the writing of this paper, one of this number, operated on four months before, has been reported to me as showing evidences of return.

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gauze, but not with the special care and precision advised by Dr. McBurney. The healing occupied about six weeks; and when the patient was last heard from, one year after, he was still in a sound condition.

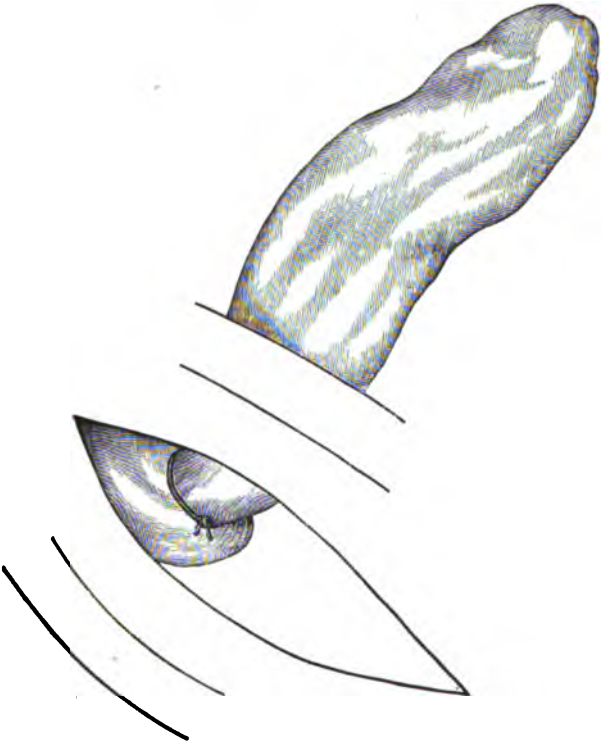

FIG. 2.—Sac going through Upper Slit of Inner Pillar.

I cannot close this portion of the subject without calling to your attention a somewhat newer method of operating that I have practised on three distinct occasions. It certainly has some features that commend it, and, believe me, neither of these has to do with the fact that the method was devised, so far as I know, by myself. It is performed by weaving the sac, after its separation and its neck has been tied with catgut, into the pillars of the ring in the following manner: Fig. 1 shows the isolated sac, with the neck D tied (see

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foot-note on page 124), also the pillars of the ring slit for the purpose of weaving. Fig. 2 shows the sac carried upward beneath the inner pillar, and through the upper slit. Fig. 3 shows the sac carried downward through the slit nearest the border of the inner pillar, thence downward beneath the outer pillar of the ring to and forward through the lower slit of this pillar. Fig. 4 shows the sac passing upward through

FIG. 3.—Sac going through Slits of Inner and Outer Pillars.

the slit nearest to the margin of the external pillar, and, finally, if long enough, upward beneath the free margin of the inner pillar again. The borders of the pillars are then approximated by making tension of the sac, and the whole mass is finally quilted together with deep stitches of catgut, leaving sufficient room, however, for the passage of the cord (Fig. 5). The external wound was closed in each instance, and primary union followed without an unfavourable symptom. One of these cases was a female, with a large, direct, painful inguinal hernia, which could not be retained in place by mechanical means, and the patient could secure comfort only by continuously assuming the recumbent posture. At the end of four weeks she was allowed to go about, and six months from this time, when last seen, was still in sound

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condition. In the second case the hernia returned six months after operation, during a severe attack of whooping-cough. The third case disappeared from observation entirely as soon as allowed to leave the hospital. This method closes the neck of the sac the same as the others, but, unlike the others, fills the inguinal canal with normal serous tissue,

FIG. 4.—Sac passing through Outer Pillar and Beneath Inner Pillars.

which is so placed as to support the peritonaeum and fasciae extensively at the weakest part. It is possible that still greater firmness can be secured if the wound be treated openly after the weaving and quilting processes are completed. In one of these cases the fasciae in contact with the peritoneal sac were not disturbed, but were woven in as if peritonaeum alone were present. This modification introduces a larger amount of tissue into the canal, and correspondingly increases the strength of the region, and likewise obviates any impairment of the nutrition of the sac that might arise from the removal of the fasciae from it. It has been assumed that the ligaturing of the neck of the sac will cause the sac to slough, especially in old persons. In one of the cases operated on by myself, the patient was about sixty years of age, and, as already reported, a rapid and uncom-

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plicated recovery supervened. However, if the danger of sloughing of the sac dependent on the ligaturing be the main objection to this method, then passive means of primary closure of the neck of the sac can be readily substituted for the ligature.[1] It is my opinion that this method cannot be

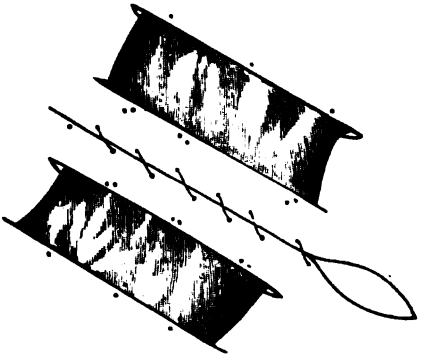

FIG. 5.—Quilted Tissues.

employed as indiscriminately as can the open method, since it frequently happens that the sac is illy developed, or so much damaged by isolation that it will be unwise to hope for particular benefit from the weaving process, even if it be possible

[1] Since the presentation of this paper, I have had an experience which has caused me to advise against one step of the operation—ligaturing the neck of the sac. In a clinic held at Bellevue hospital but a few days since, this method of treatment for radical cure was practised on a patient aged fifty-two. Four days after the operation a temperature of 102 degrees caused an examination of the wound to be made. The superficial tissues had healed perfectly, but a limited separation of them, made for the purpose of examining the condition of the interwoven sac, disclosed the fact that limited portions of the sac were undergoing inoffensive disintegration. It has frequently been my practice to ligature the neck of the sac, before ruffling and depositing it, after the method of Macewen, and never before have symptoms arisen that were suggestive even of the idea of a similar unfavourable result. However, it is proper to say in this connection that since the avowal of the unfavourable course in this case, others of a similar nature, in connection with a different method of operation in the practice of the hospital, have been announced. It is now my intention to omit ligaturing the neck of the sac, and to employ instead a more passive means of closure.

At the next opportunity I shall scrape the inner surface of the neck of the sac slightly with a knife, and then pass a catgut ligature through and around both walls of the sac at the middle of the neck, close to the abdominal peritonæum, so as to include in the grasp of the ligature a portion say one fourth of an inch in width.

The ligaturing of this portion will prevent the entrance of the viscus into the neck without impairing the nutrition of the sac, until fibrous closure of the neck has taken place under the pressure of the dressings.

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to employ it; and, too, not infrequently the external pillar of the ring may be found to be so narrow and attenuated as to render its slitting impracticable. The following conclusions are submitted in connection with this phase of the subject:

1. That the open method of treatment is the most rational and the simplest method for the radical cure of hernia, provided the resulting cicatrix meets the expected requirements; consequently, the additional time required for treatment by the open method will be time well employed, if the cure resulting from this method should offer greater immunity from return of hernia than does that of any other method of treatment. 2. That the best sources from which to judge of the absolute and comparative results of the methods of radical cure are afforded by infirmaries for the ruptured, where the unfortunate persons finally go for relief as a last resort. 3. That failure of the open method to cure leaves the patient less amenable to the beneficial effects of a truss and to subsequent radical treatment, than a failure from the non-open method, by reason of the substitution of cicatricial for normal tissue; therefore, the percentage of primary cures from the open method should much exceed those of other methods, to insure the final benefit of the patient. 4. That the interweaving of the sac with the pillars of the ring, followed by open or closed treatment of the wound, will afford in many cases equal and even greater security than any other method of treatment.

The "medicinal and manipulative measures" of "palliative character" employed for "strangulated hernia," and the "reliance" placed in them, will be governed largely by the experience of the medical attendant; by the surgical atmosphere in which he moves; by the means of carrying into effect the measures which he deems best for the patient; and they will be modified not a little by the predilections of the patient and his friends. The medical measures that quiet pain the easiest and quickest, and cause complete relaxation of the tissues, are the palliative remedies to be employed. The measures that favour most the influence of the force of

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gravity on the protrusion, with or without the use of taxis, are together the palliative manipulative measures of standard reliability. Morphia injections, hot water baths, with elevation of the part bearing the hernial protrusion, are the best and most available means at the command of the medical attendant. If these be combined at once with well directed and moderate taxis, a successful return of the viscus may be prognosticated under ordinary circumstances. If these means fail, and the local or constitutional symptoms of strangulation continue, then taxis should be tried again briefly under complete anaesthesia, and, if not successful, herniotomy should follow at once. Too long, too frequent, and too forcible taxis are the ruling tendencies outside of hospital influences. Taxis ought not to be employed continuously for longer than a quarter of an hour. If it be properly directed, this is sufficient time in which safely to effect a reduction of the gut; if improperly directed, then even *this* is much too long a time. The frequent employment of taxis in a single case arises from the unwise practice that often inspires each medical man who comes in contact with the patient to attempt the reduction. The majority make the attempt from proper motives; a few from vain and selfish ones, that too often prompt the effort only because others have failed. The latter are the "John Horners" of the case, who, although they may not "stick in a thumb," try to "stick in" the viscus, and, if successful, each will cry "What a brave boy am I." Too forcible taxis comes of inexperience, haste, and unwarranted energy. Inexperience as a cause will always exist, but haste and unwonted vigour need never be practised. In view of the general knowledge of antiseptics in surgery, and of the results of their use, and also of the immense advantage to the patient from a radical cure, there is little ultimate benefit that can come to a patient now from even the wise and successful employment of taxis. However, it is not my intention to advocate the abolition of taxis; there is nothing so practical that can take its place. The ablest surgeon, the humblest physician, and the suffering

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patient, each employs taxis at the onset of the case, and not infrequently the self-experienced and self-educated patient employs it even more successfully than either of the others. It is the *abuse*, not the *use*, of taxis that demands condemnation. The medical attendants of hernial unfortunates should employ taxis when required, and should know how to do it properly in all respects. There are far greater numbers of medical men who can perform taxis successfully, than who can operate properly on strangulated hernia. Improperly performed taxis, when employed as cases arise, is not as fatal a procedure as inexperienced, bungling herniotomy under like circumstances. It is well to remember, that, however confident the surgeon may be of the proper course to be pursued in a special case, the patient and the friends may differ from him in some important respects. They will often oppose operative measures, because patients of whom they have known have died after the performance of them, and also because persons have recovered without them, and this in the face of the positive assertion of the surgeon that life can be saved only by operation. In such instances as these, one has but to state firmly, yet respectfully, his convictions of the case, and, if unheeded, then decline to assume a responsibility which he himself can have no voice in creating. Your attention is invited to the following conclusions regarding this part of the discussion:

1. The abuse, not the use, of taxis constitutes an evil against which all surgeons should protest.

2. That a quarter of an hour of well directed and continuously applied taxis is a rational procedure: longer than this is unnecessary, therefore unwise and harmful.

3. That repeated attempts at reduction on the part of different persons are pernicious, therefore dangerous and destructive.

4. That the present status of modern operative surgery has reduced the successful employment of taxis to the position of rendering but little practical benefit to the patient, except in special cases.

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The rigid enforcement of antiseptic principles should be adhered to in all cases of hernial surgery. The antiseptic technique is as essential in successful operations for radical cure as in herniotomy itself. Hours can now be consumed in writing numberless pages on the "best technique applicable to an operation for strangulation hernia," and at the end of the time little more will be said than ought now to be well understood by all such as may be called on to operate for relief from this physical calamity. I will not, therefore, take the time of the Association by dwelling on the details of the line of incision, division of layers, identification of the sac, location and division of the constriction, etc. It is my belief, however, that the surgeon who now neglects to perform an operation for a radical cure, as an addendum of herniotomy, falls short of his duty of consulting the best future welfare of the patient, provided, of course, that the immediate condition of the patient and of the tissues will permit. The question as between the selection of the open or non-open method in these cases is largely a matter of expediency, in which the patient and friends should be consulted at the onset. If the time at the patient's command be short, and the condition of the tissues be favourable for it, then the non-open method should be selected. If, however, the final benefit to the patient alone be the only matter for consideration, then it is hoped that the open method may prove more highly commendable. The following conclusion is submitted:

That, all things being equal, radical cure should be practised as an addendum to herniotomy.

It happens occasionally that gangrene of the contents, or even of the sac itself, complicates strangulation. This is a complication of vital importance to the patient in a literal, and to the surgeon in a professional, sense. The proper treatment of such cases calls for as great display of skill and judgment on the part of the surgeon as is required for the treatment of almost any other surgical condition. The treatment of this complication should be divided into two classes,—the *preventive* and the *remedial* treatment. The preventive

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treatment consists in an early reduction by taxis or by other means; or, failing in reduction, a prompt operation. The extremes of time after strangulation, before gangrene occurs, can never be accurately known: nor is it wise that these periods should even be approximately known, since it is unwise and dangerous to allow the question of the length of time of the existence of strangulation, as bearing on the occurrence of gangrene, to exercise any special influence on the operative judgment of the surgeon, since the existence of gangrene cannot be usually determined until after exposure of the contents of the sac by operation. The waste of important time in either nursing or considering hair-splitting theories, or in idle and useless prognostication, is evidence of the fact that much learning may become more dangerous even than a little.

The remedial treatment applies to the question, What shall be done if gangrene have occurred? If the sac alone be gangrenous, which is improbable, the gangrenous portions should be removed, the contents of the sac returned, the neck of the sac closed, superfluous portions of the sac cut off, and then radical cure should be sought for under the open method of treatment. If the intestine be gangrenous, the surgeon will then be obliged to entertain the propriety of practising one of the three following plans: (1) Of leaving the gangrenous intestine alone and relying on nature to form an artificial anus; (2) of the removal of the gangrenous portion and the stitching of the gut to the wound (if the constriction have already been divided), thus forming an artificial anus; (3) of excision of the gangrenous portion, immediate union of the extremities by sewing, and the return of the intestine to the abdominal cavity.

Which one of these plans should be adopted will depend largely on the following considerations: (1) The physical condition of the patient; (2) the physical condition of the wall of the intestine; (3) the portion of the intestinal tract involved by the gangrene; (4) the surgeon's available knowledge of the technique of the requirements of the case.

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It is not, in my judgment, ever advisable to allow nature an unaided course in the matter. The sooner the tension within the intestine is relieved by causing a free escape of the obstructed contents, the sooner relief will be had from the distressing symptoms of strangulation. It is not difficult to understand that the additional time required to bring relief through nature's efforts alone might be the determining cause of the death of the patient; and, too, the early relief of the intestine from the effects of internal pressure and extreme vascular plethora will reduce the extent of the sloughing to a minimum. There appears to me to be no doubt of the fact that, after carefully protecting the wound from contact with the intestinal contents, the gangrenous intestine ought to be incised sufficiently to relieve its fecal and vascular plethora. I deem it unwise to divide the constriction before incision and depletion of the intestine, except the constriction be thought to be too narrow to permit the escape of the contents without division—a degree of closure that must be rare indeed. The reasons for this opinion are,—(1) Such a course may permit the intestine to elude the grasp of the surgeon and escape into the abdominal cavity, with inevitably fatal results; (2) after depletion of the intestine, the division of the constriction may be found to be unnecessary, and even unwise, if the establishment of a temporary artificial anus be contemplated. However, if, after depletion, the extent of the gangrenous portion of the intestine appears to be limited in part or entirely by the seat of the constriction, or the amount of non-gangrenous intestine outside of the seat of stricture be too small to meet the requirements of a properly formed artificial anus, then the constriction should be carefully divided, and the intestine drawn down sufficiently, at least, to bring to view a healthy, complete intestinal circumference, which should then be stitched to the border of the wound with silk, or otherwise retained if immediate or remote enterorrhaphy be contemplated. If, after the depletion of the intestine, a sufficient amount of non-gangrenous gut remain external to the constriction to meet the further de-

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mands of the case, then the constriction need not be divided, provided, of course, that the internal pressure from intestinal contents has been entirely relieved. The means to be adopted by the surgeon to determine the existence of gangrene of the gut are established, and can be found in innumerable publications. I can add nothing to the list of stereotyped measures so long employed for this purpose. After exposure of the gut, if the question arise as to whether or not gangrene may supervene, care should be taken to completely relieve all constriction of the gut, and also to retain it *in situ* until this element of the prognosis is determined: then the degree and extent of the gangrene will control the subsequent action of the surgeon. If it be of so small an area that its removal and repair will not reduce the calibre of the intestine to less than two thirds the normal diameter, the gangrenous area should be removed, the opening closed by sewing, and the intestine returned to the abdominal cavity. It is important to remember, however, that an impairment of the mesenteric border of the intestine should not be thus treated; this condition calls for excision of intestine to the extent of the mesenteric impairment, otherwise gangrene of the intestine may ensue to a similar extent. If gangrene of the gut be too extensive to admit of a simple method of repair, what then should be done? Should an artificial anus be established, to be cured by a subsequent operation, or the gangrenous intestine be excised at once, the extremities united, and the bowels returned to the normal cavity? If the condition of the patient be such as to warrant the belief that an operation of an hour and a half or two hours' duration may be performed with reasonable safety, the intestine should receive a radical and permanent treatment at once, and be returned into the abdominal cavity.

If the character of the intestinal discharges, the situation of the protrusion, and the anatomical characteristics of the bowel warrant the belief that the jejunum be involved, then radical operation should be performed at once, even at great risk to the patient, otherwise rapid inanition will ensue,

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which, if it do not destroy the patient in a few days, will so quickly enfeeble him as to preclude the possibility of a favourable result from a future operation. As an illustration of this, Riedel reports a case where the opening into the intestine was located about half way between the pyloric extremity of the stomach and the caecum (eleven feet), in which rapid inanition ensued, and at the end of twelve days radical operation was performed as a last resort, and without success. It is wise in this connection to remember that the jejunum is commonly located in the umbilical and left iliac regions of the body.

The condition of the walls of the gut, adjacent to the opening in it, does not exercise a very important influence on the success of the immediate radical, or the temporary anal, operation for gangrene, because in either instance sufficient intestine can be readily withdrawn to secure sound and non-congested tissues for sewing. However, other things being equal, it is better to restrict the extent of the excision of the intestine to the narrowest practicable limits, for the longer the piece removed, the longer will be the time employed in the operation. The congested state of the intestine should not cause delay in the operation if the intestine be involved in the upper two thirds, since the danger of inanition due to delay will be greater to the patient than the sacrifice of all the congested intestine contiguous to the opening. In all cases, the sewing should be done in the perfectly normal intestinal tissues, if the best results are to be expected. It is proper to say at this time that the removal by excision of four or five feet of small intestine need not cause undue apprehension as to the possibility of inanition of the patient. Koeberlé is reported to have excised nearly seven feet without causing a resulting appreciable change in the nutrition of the patient.

In the operative treatment of gangrene of the intestine by the radical method, rapidity, thorough antisepsis, and complete familiarity with the technique of the steps of enterorrhaphy are of most vital importance,—so important, in

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fact, that the operation should not be attempted except by the best skill at command. It is far better for a patient that an artificial anus be made, even with unfavourable prospects, than that immediate radical measures be attempted by those not familiar with their surgical technique, since it may soon be possible to secure the necessary skill. It will be noticed that I have not employed statistics, nor described the minute details of measures on the knowledge of which strong insistance has been made. The reasons for this course are twofold: (1) Because time would not permit it; (2) because these facts could be more appropriately considered in connection with the special parts of the discussion allotted to others. The following conclusions appear to me to be properly deduced from the preceding statements:

1. When gangrene of the intestine has taken place, and the condition of the patient will permit, intestinal repair should be practised at once, and the gut returned to the abdominal cavity.

2. When gangrene has occurred, presumptively involving a portion of the upper two thirds of the intestine, intestinal repair should be practised at once, and the gut returned to the abdominal cavity, even if the immediate result of the operation be somewhat doubtful.

3. When gangrene has occurred and the condition of the patient will not permit immediate operation, a temporary artificial anus should be formed.

4. It is better to form an artificial anus under all circumstances, when the medical attendants are not familiar with the details of intestinal surgery.

5. Division of the constriction is not always necessary, and is often unwise when the formation of an artificial anus is contemplated.

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QUESTION I.

WHAT SPECIAL MECHANICAL TREATMENT HAS PROVEN MOST SERVICEABLE FOR EACH VARIETY OF REDUCIBLE AND IRREDUCIBLE HERNIA?

Discussed by

S. E. MILLIKEN, M. D., of New York County.
T. H. SQUIRE, M. D., of Chemung County.

DR. S. E. MILLIKEN.

At the Hospital for Ruptured and Crippled of this city I have had an opportunity to treat, mechanically, many cases of hernia, the average daily attendance being between forty and fifty patients.

While it is found that the simple and inexpensive truss of Dr. Knight, the founder of the hospital, is satisfactory in a large proportion of cases, it is necessary occasionally to resort to other forms, as no one form is applicable to all cases.

Inguinal hernia.—The great majority of cases being inguinal, my remarks will for the present be directed to this variety. For convenience and practicability, I have divided it into three degrees, as follows: (1) A simple bubonocele, when the viscus remains in the canal; (2) the hernia is without the external ring, but the canal remans oblique or intact; (3) the canal is obliterated, and the external ring is enlarged. This last degree is practically a direct hernia.

The difficulty with which herniae of the first and second degrees are retained is usually not great when a truss is employed. The most satisfactory treatment has been the use of one of the following five forms of truss:

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1. The spiral spring, of which there are many modifications, and which is too well known to call for description. This style is especially adapted to patients that require perfect freedom of the abdominal walls, as only a leather strap is in front. In cases of the third degree, it is often necessary to attach a perineal strap, and even with this procedure a few exceptionally difficult cases cannot be retained.

2. The "Knight" truss, which has a band that is almost elliptical, and extends about three fourths around the body; on the end is attached a malleable shank with a round or oval pad. The band should be so tempered that it can be fitted to the body after it is covered. The mechanism is very simple, and, with the proper adjustment of the shank, there are very few cases, even of the third degree, that are unmanageable. The addition of a perineal strap assists greatly in keeping the pad in position. A double truss can be made by attaching another shank about four or five inches from the end of the band that crosses the abdomen.

3. A form of truss which differs from the above only in having no shank. The "Seeley," which is covered with hard rubber, and the celluloid "Pennfield," are the most durable examples of this form. This truss is better suited to the first and second degrees, because the pressure does not have to be made so low. It is also applicable to the third degree, but is somewhat less efficient than the "Knight."

4. A complete band, which is exemplified by the "Hood." This truss has a tempered bar on each side, that extends from the sacro-lumbar joint to the inguinal region, where it is attached to a slotted steel plate, which is connected with its fellow on the opposite side by a bar that is considerably heavier than those of the side. The pads being also slotted, allows the truss to be adjusted to suit nearly all forms of inguinal hernia. With a well fitting band, the antero-posterior pressure can be regulated by the thickness of the pad. Only in extreme cases of the third degree does a large pad have to be employed.

5. A truss with a complete band and a shank, which has

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proved quite efficient in corpulent cases with large rings. This is simply a combination of the "Hood" and "Knight" trusses. The band, which is a single piece of bar steel, is fitted to the pelvis and abdomen with the patent standing. It is especially important that the band should come just beneath each anterior superior spinous process, to prevent upward displacement. Although the band crosses the lower portion of the abdomen, it need not restrict its movements, because it can be arched forward without decreasing the usefulness of the truss. The shank has to be slightly longer than on the "Knight," but otherwise it is the same. The band has about the same dimensions as that of the "Hood." The use of this truss has been limited to those cases in which the hernia was especially difficult to retain; and care has been taken to get a perfect fit in each instance. But for the majority of cases of inguinal hernia it is quite unnecessary to make special trusses when such a variety of forms are ready at hand.

Femoral hernia. As the anatomical relations are much less varied in femoral than in inguinal hernia, it is unnecessary to make any subdivision of this class of cases. It is very rarely difficult to retain these herniae, however simple the appliance may be. The two styles of truss that are best adapted to its treatment are the Spiral Spring and the "Knight."

Umbilical hernia. The most satisfactory treatment of umbilical hernia in children has been with rubber adhesive plaster and a small pad. The plaster should not be changed more frequently than once a week, and should be allowed to remain two weeks if no excoriation is produced. In patients over three years of age a French umbilical truss can be applied, but difficulty is often encountered in keeping the pad in position. The percentage of incurable cases in children is very small, while in adults it is the reverse. As only palliative measures are usually attempted with the latter class, it is found that the abdominal supporter answers admirably.

Irreducible hernia. In the majority of cases of irreducible hernia of the inguinal and femoral types, operative treatment

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is advised; but there is a certain number of cases of epiplocele which present only slight symptoms, and which decline to be operated upon. In this class of cases, the application of a simple spica, with a soft pad, reäpplied every day, often accomplishes partial or complete reduction after a week or ten days. This method has been chiefly effective in cases of femoral hernia. Irreducible, umbilical hernia is almost exclusively met with in the adult, and more than palliative measures are rarely attempted. Should no symptoms of incarcerations be present, the application of an abdominal supporter usually partially reduces the mass; and this can be still farther assisted by the addition of a large flat pad.

DR. T. H. SQUIRE.

[Read by title.]

In ordinary reducible hernia, I depend upon an ordinary truss, not to cure, but to keep the protrusion back. Generally the truss meets the requirements, and the patient attends to business without complaint.

In ordinary cases of strangulated hernia, I try taxis, under decided morphine narcotism, or an anaesthetic, with patients in the recumbent posture, hips elevated, and all muscles relaxed. I gather up the integument, and make gentle, uniform, continued pressure on all parts of the tumor, with occasional lateral motions, trying to induce the deeper part of the protrusion to return first, and the other parts to follow. If moderate taxis succeed, I consider myself fortunate; if not, I advise herniotomy, for I believe that taxis does harm if persevered in too long, by several hands, especially if excessive force be used. I do not know how many cases I have seen, nor what percentage of them have been successful, with taxis. In two or three cases the tumor has returned spontaneously, where I have failed with taxis. Such cases are exceptions to the rule.

In operating for strangulated hernia, after the skin has been divided I raise the succeeding layers on a director and

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divide them; and when I think I have reached the sac, I lift a small point of tissue with tenaculum, and cut it with scissors. If serum then flows, I know the sac is opened; if not, I go on till I see omentum or intestine, and thus get positive evidence of the opened sac. Then exploration with the end of the finger locates the seat of stricture. With the finger as a guide, the beak of the hernia knife is carried through the stricture till its edge is brought in contact with the constricting tissue, when the blade is turned, and the stricture is relieved. I give the sac no care after its contents have been returned to the abdominal cavity. The external wound is sometimes completely closed, and sometimes the lower angle is left open for drainage.

Herniotomy is not, I think, a dangerous operation when performed early and carefully.

In one case, where the strangulated loop of intestine was largely distended and tense, and the stricture extremely tight, as I was forcing my finger into the place where the beak of the knife was to find entrance, a small rupture took place in the bowel at the summit of the tumor, and quite a quantity of blood or bloody serum flowed out, and the loop collapsed. It became necessary for me then to use a very fine suture of silk, and close the rent before dividing the constriction and returning the gut. The patient recovered. In such a case it would be well to use an aspirator first to relieve the tension.

In one case, where a man had for years an old irreducible, omental hernia of large size, a new protrusion of intestine occurred, with strangulation. I operated, relieved the stricture, returned the loop of the intestine, and then transfixed the neck of the old omental mass, which was the size of a large orange, and removed it, allowing the pedicle to remain in its place and the ligature to protrude as a drain. The wound was partially closed. In due time the ligature came away, the wound healed by granulation, and the patient did well, and is living to-day, wearing a truss.

I have no experience in operations for the radical cure of hernia.

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QUESTION II.

WHAT IS THE PRACTICAL WORTH OF THE "INJECTION" METHOD OF TREATMENT FOR THE RADICAL CURE OF SIMPLE REDUCIBLE HERNIA?

Discussed by E. M. MOORE, M. D., of Monroe County.

[From Stenographic Report.]

Dr. Moore said that he had operated successfully on cases of hernia, following nearly all the methods which had been advocated, but always with a certain feeling of timidity about touching the peritonaeum. He then gave a brief account of cases which had been operated on by the senior Dr. Pancoast when the speaker was intern under him. The operation for radical cure of hernia had not at that time been performed on this side of the Atlantic. Four cases were treated by injection. Dr. Pancoast was so fearful of peritoneal inflammation that he had a fine trocar made and a small gold canula. The point of the trocar was round, so as to avoid cutting the tissues and thereby causing haemorrhage. This instrument was plunged into the tissues at the neck of the sac and forced down to the bone so as to insure a sufficiently deep injection. The trocar having been removed, twenty-five drops of the officinal tincture of cantharides were injected. The cut produced by the needle healed immediately, but the irritation caused by the injection was very considerable. The swelling was marked, and very hard along the line of the cord. At first some alarm was felt lest the peritonaeum should become inflamed; but this did not happen, and the patients progressed favourably as far as the hernia was concerned. Unfortunately one of

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the patients died of typhoid fever. The ultimate results in two of the other cases were not known, as the histories of the patients after the operation could not be traced. One of the cases presented an enormous scrotal hernia. After the injection the swelling of the parts was very great, and the cure apparently satisfactory; but the patient refused to wear a truss, and the hernia returned.

Some time afterwards the speaker took care of a case operated on by another physician for the radical cure of an ordinary inguinal hernia. The operation consisted in cutting and tearing through the tissues until the neck was reached, and then introducing six drops of oil of cloves by means of an ordinary glass syringe. The patient was placed in bed, and advised to wear a truss even while recumbent. This, it was subsequently learned, he neglected to do, even rising from bed without adjusting the truss. Nevertheless he made a perfectly successful recovery, and although he returned to his work—that of waiter at a hotel—without using a truss, there was no return of the trouble.

Dr. Moore said he had never himself employed the injection method for radical cure of hernia. He had operated in one case by invaginating the sac and then passing a seton through the tissues, causing a suppurative inflammation which eventuated in the formation of a dense tissue sufficing to keep the intestine in place. This case led him to devise an operation of his own, of which he had not intended to speak, feeling that later operations had improved upon it. The procedure he had thought of, at a time when aseptic surgery was unknown and subcutaneous operations the aim of the surgeon, was the twisting of the sac upon itself by means of a round needle introduced beneath the skin, so as to bring its surfaces together, and then to set up an adhesive inflammation by puncturing the walls of the sac with pins. In this way he had operated successfully, with a permanent good result. He had not elaborated this procedure farther because antiseptic surgery had made it unnecessary.

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QUESTION III.

WHICH IS THE BETTER METHOD OF TREATMENT FOR RADICAL CURE, THE "OPEN" OR THE "NON-OPEN" METHOD, AND WHICH IS THE BEST PLAN OF PROCEDURE IN EACH OF THESE METHODS?

Discussed by

ROSWELL PARK, M. D., of Erie County.
[From Stenographic Report.]
WILLIAM T. BULL, M. D., of New York County,
and others.

DR. ROSWELL PARK.

Dr. Park said that he had been surprised to read in a recent monograph that the radical cure of hernia was regarded as a rare achievement. He believed firmly in making the attempt to cure every case of hernia radically, because the cure *is* radical in a large percentage of the cases, and because, even if success be not complete, the patient is always benefited. If the hernia recur, it is not so serious as at first. Men who were not capable of taking exercise because of their herniae can be rendered good working members of society.

For closing the external ring he at first used catgut in a number of cases, but came to the conclusions, on theoretical grounds rather than because of practical ill success, that it was absorbed too quickly. He then employed antiseptic silk sutures for a while, but a little suppuration following their use on one or two occasions, he abandoned silk for silver wire, which he used in some twenty-five to thirty cases. In

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only two cases with the latter material had there been any suppuration.

He considered that the beauty of the operation commended by Czerny was that it could be combined with the operation for strangulation, and offered a reasonable security from recurrence of the hernia by closing the hernial outlet. It took very little time to make this addition to the ordinary operation, and he thought every one ought to do so. He had done so in about forty cases, and in only two was there any return of the hernia as far as he knew. In the first of these the return occurred about ten days after the operation, and was occasioned by a fit of coughing induced by a glass of wine taken while the patient was sitting up.

Dr. Park said he preferred the closed to the open method, his objection to the latter being that the cicatricial tissue closing the hernial canal would inevitably stretch and dilate. He thought a large scar more liable to yield than a small scar. In the open method the scar must be three eighths to three quarters of an inch wide, since it was intended to replace the external ring and anterior wall of the inguinal canal. He saw no advantage in such a cicatricial mass over a simple linear scar when once the canal had been laid open.

He thought it a mistake to think it only necessary to close the external ring. It is necessary to occlude the canal at the *internal* ring. He thought some of his earlier operations faulty in this respect, and felt confident that the percentage of cures would be proportional to the thorough closure of the inguinal canal.

He had discouraged the use of a truss after the operation for radical cure of hernia, unless the wound were receiving more strain than appeared safe. This was because be believed the pressure of the pad tended to promote absorption of the cicatricial tissue, upon which we depend for the retention of the bowel.

He congratulated Dr. Bryant on the operation which he had devised and explained to the Association, and said he should certainly employ it on the first case to which it was

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applicable. He regarded the closure of the inguinal canal with fresh, living tissue as infinitely better than its closure with anything else.

Dr. Park then proceeded to a discussion of the considerations which should guide the surgeon in the employment of the operation for radical cure of hernia. He said that his confidence in the operation was so great that he would recommend it to any patient who was tired of wearing a truss and found his hernia vexatious. He did not think the risk, if a favourable opportunity were selected for the operation, much greater than that of travelling by rail. When the operation had been decided on, the patient should be carefully prepared for it. At the time of operation the incision should be long enough to expose the parts, and then the sac carefully isolated and destroyed. The proper destruction he now thought would be that proposed by Dr. Bryant. Up to within the last two years he had employed drainage, but he now made his operations as aseptic as possible, and had seen better results where drainage was not used than where it was used.

His cases of deliberate operation numbered sixty,—forty-four males and sixteen females,—the oldest seventy years and the youngest about five. In six cases the operation was bilateral. Suppuration was noticed in only five cases where it could be attributed to defective technique. In three cases there was a slight return of the hernia, but only such as could be readily controlled by a light truss. In two other cases there were slight returns reported, but the speaker had no personal knowledge of them.

He considered the advantage of the closed method over the open method to be, that it made it possible to bring together the edges of the cut fasciae, thus achieving on a small scale the same good results as were obtained by the proper closure of large abdominal wounds.

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DR. WILLIAM T. BULL.

My experience with operations for the radical cure of hernia began seven years ago, when I became acquainted with the results obtained by English and German surgeons. These were detailed in elaborate statistics by Leisrink[1] in 1883. The methods employed were all of the order which may be called "closed" or "non-open" in contradistinction to the method called "open," which has been advocated quite recently. In the closed methods, the wound, or the wound and the inguinal canal, is closed with sutures, while the sac is obliterated with suture or ligature at the site of the internal ring or below it, and the fundus excised or drained.

The study of Leisrink's statistics satisfied me that one essential feature of the operation was the ligation of the sac high up—a point which has since been generally agreed upon. But I was in doubt as to the relative value of the method of suturing the pillars of the ring as compared with that of leaving them to healthy granulation or primary union beneath the sutured skin.

In order to obtain information on this point, I have performed a number of operations by both methods. In one set of cases the sac was ligated at its neck, and the pillars of the external ring sutured with catgut. This is a combination of the method of Riedel and Czerny, which has been employed with much success by Banks,[2] who, however, uses silver wire instead of catgut sutures. This I will denominate the method by ligature, excision, and suture.

In the other set of cases the sac was ligated as before mentioned, and the wound closed over a drainage tube lying in the open canal—a method which Socin[3] has reported favourably on in a large number of cases. In both methods the treatment of the sac after ligation of its neck has been to excise it when small, to leave it in place, and drain it through

[1] Die moderne Radikal-Operation der Unterleibsbrüche. Hamburg: Leopold Foss. 1888.

[2] British Med. Journal, December 10, 1887, p. 1259.

[3] Revue de Chirurgie, April 10, 1888, page 264.

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the scrotum when it was large and when it contained the testicle, as in congenital cases.

In addition to the observation of these cases I have had the opportunity at the Hospital for Ruptured and Crippled to see cases of hernia which have relapsed after various methods of radical cure, and I have gained thereby some knowledge of the results of operations which I have not personally performed. It is in this way that I have gained some convictions with regard to the "open method," which, I believe, warrant me in expressing an opinion as to its merits compared with those of the "closed" methods.

To report at the present moment one's personal experience of an operation which has already a very extensive literature, and which has, since its general adoption, been subjected to many modifications and so called improvements, may seem like narrating ancient history; but it must not be forgotten that the subject is one of vast importance, which must be ultimately settled by the accumulation of the experience of a number of operators. Each one can contribute his best "mite" by faithfully following a given method till the number of cases and the time over which his observation of the results extends have demonstrated its advantages or its shortcomings. This element of time is a very important one in hernia; and it is to be regretted that many of the recent modifications of the radical cure have been proposed or supported after observations covering only a few months. In fact, as the number of modifications has increased, the period of observation seems to have lessened. There are too many procedures, and too little definite and convincing information, about each. This state of things confuses the judgment, and impedes rather than advances our knowledge. To use the words of Dr. Martin,[1] who read a very exhaustive essay on this subject before the American Surgical Association in May of this year:

"At this date the operation which is best calculated to offer general satisfaction remains a mooted question; and

[1] Trans. Am. Surg. Assoc'n, vol. vii, 1889, p. 56.

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until more accurate experience decides it, the selection of the special operation must remain still *sub judice.*"

It is in accordance with these considerations that I contribute at the present time only seventy-two cases of hernia that have been operated on for a time exceeding one year, since it has been observed[1] that most of the relapses occur within this period. Another series of about thirty cases, operated on by another variety of the "closed" method, since November, 1888, will be ready for publication next year.

I am indebted to Dr. Albert H. Leyton for the compilation of the records and the investigation of cases after their discharge from the hospital.

Of the seventy-two cases above mentioned, thirty-eight were treated by the method of "ligature, excision, and suture," and thirty-four by "ligature and excision." There were three deaths—a mortality rate of 4.2%; but these deaths are of little significance, since they resulted in conditions that we have gradually learned to avoid, or from accidents, the liability to which diminishes as one's experience increases.

The first was one of the earliest cases, a reducible but uncontrollable scrotal hernia in a man of eighty, with atheromatous arteries, who was subjected at the same time with the hernia operation to the radical cure of hydrocele by Volkmann's method. The sac of the hernia was ligated and excised, and a mass of omentum removed. Death resulted from a slight haemorrhage into the peritoneal cavity.

The second case (No. 28) was an irreducible scrotal hernia in a man of thirty years of age. The sac was ligated after removal of the omentum, and the ligature applied to the latter slipped after it was within the cavity. In order to regain the stump and apply another ligature, the hand and forearm had to be introduced into the cavity through a much enlarged incision. There was no further bleeding, but death ensued in twenty-four hours, apparently from rapid septic peritonitis.

[1] Johannes Anderegg, Deutsche Zeitschrift of Chir. 24, p. 207.

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The third case (No. 68), one in which the ring was sutured, was a large strangulated scrotal hernia, which necessitated much exposure of the intestine. This died of shock in twelve hours, a result to be fairly attributed to the operation for the strangulation, which was not materially prolonged by the effort at radical cure.

It seems to me an unnecessary elaboration of statistics at this time to separate the results obtained by the two methods in reducible, irreducible, and strangulated hernia. In the two latter forms surgeons generally favour the operation. In strangulated hernia, when the gut cannot be, or is not deemed fit to be, replaced, the radical cure cannot be done; and the operation is certainly attended with risk in large scrotal enteroceles which are irreducible.

So, too, old or feeble subjects, or very large reducible herniae, are unfit for the operation, and children under twelve or fourteen can be most wisely treated by mechanical appliance.

It is in accordance with these general indications that my operations have been done. Of the seventy-two cases, twenty-nine have been reducible, thirty-one irreducible, and twelve strangulated.

The reducible cases were all such as had been controlled with pain or difficulty by a truss, or (in a few instances) have requested the radical cure.

In getting at the results as to cure in the sixty-nine patients who recovered after operation, twenty-nine cases must be discarded because they could not be found after leaving the hospital. Of the forty remaining, all were inspected at periods varying from a few months to six years. There were just twenty in each class. Twenty patients operated on by the method of ligature, excision, and suture of the pillars of the ring give twelve cures and eight relapses or failures. The same number of cases operated on by the simpler method, ligature and excision without suture, give exactly the same proportion, twelve cures and eight relapses—a curious coincidence. By both methods, in all varieties, there were sixty per cent. of cures and forty per cent. of failures.

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With reference to the variety of hernia, the latter show that of twenty cases treated by ligature, excision, and suture, eighteen were inguinal herniae and two were ventral (in the middle line between the navel and sternum). In the ventral herniae it was, as a matter of course, the aponeurotic edges of the hernial orifice that were sutured. One of these relapsed, the other did not. The suture is not applicable to femoral cases. Hence, we can only institute a comparison between the results in the inguinal and femoral cases by considering the results of the ligature and excision.

Of the inguinal, five relapsed and three were reported cured. Of the femoral, three relapsed and four were considered cured—a difference so trifling that I have not thought it worth while to compute the percentage. I consider, then, from these results, that in a general way there is little choice between the operations: but I would give the preference to the simpler operation, that of ligature with excision or drainage of the sac. It has the additional advantage of being applicable to both inguinal and femoral hernia.

Further investigation of the cases, with regard to the period when relapse occurred, gives additional support to this method, as the following table will show. Though relapse occurred at an earlier period on the average, there was at the end of a year a much smaller percentage of relapsed cases.

TIME OF RELAPSE.

	I. By ligature and excision.	II. By ligature, excision, and suture.
Earliest relapse noted in	1 month.	4 months.
Latest relapse noted in	42 months.	40 months.
Relapse occurred on the average, .	12⅛ months.	12⅝ months.
Percentage of cases relapsing in 12 months or earlier, ...	62.5%	75%

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Since the period of so called cure is rather a variable one, it is worth while to note the merits of each method in this respect. In all but two cases the time of last inspection or report was one year or more from the time of operation, and these two cases were lost sight of after inspection.

	I. By ligature and excision.	II. By ligature, excision, and suture.
Shortest period without relapse ("cure"),	5 months.	2½ months.
Longest period without relapse ("cure"),	6 years.	2 years.
Average period without relapse ("cure"),	22¾ months.	13½ months.
Number cured at end of 1 year and over,	7	8

Here, too, the simpler method has the advantage, since the cases which have not relapsed at time of inspection have been seen at a much later period from the time of operation.

I will not go into details of the comparative time of treatment and the healing of the wound, because I am convinced that my experience will accord with that of others who have found more difficulty in getting prompt union in the wounds where the pillars were sutured. I am sure there are more cases of prolonged suppuration and slow healing sinuses, due to local sepsis, than in the other wounds. The duration of treatment will be found to "average" longer, I am sure, when the canal is closed with sutures. Taking both methods into consideration, the longest duration of treatment in sixty-nine cases was eighty-five days; the shortest, ten days; the average, sixteen days. Primary union occurred in thirty-two cases, and there was more or less suppuration in thirty-seven cases. The effect of wearing a truss after the operation has been thought by some an advantage, while others have claimed that it increased the tendency to relapse. The testimony of my cases is as follows: Of twenty-five patients, fourteen wore trusses, ten had no relapse, and four relapsed. Of eleven cases wearing no truss, nine had no relapse, and in

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two the rupture reäppeared. These figures would seem to show that the truss does not increase the tendency to relapse, nor does it always prevent that disaster. It seems common-sense to believe that if, as we know, a truss will prevent a rupture once formed from getting larger (and in some cases actually effect a cure), it will not do harm in a case that has been operated on. In view, then, of the fact that a large number of operated cases do eventually relapse, why not avail ourselves of the only means we have to prevent that, even if it be not always trustworthy? I should, in the future, whenever I have occasion to perform this operation, invariably advise the use of a truss; but I should take care to have the spring a very light one in order that no injurious pressure may be made on the parts at the seat of operatino.

I must admit that the study of these cases leads to a feeling of disappointment so far as the question of radical cure by these two methods is concerned. The results justify the criticism which has been made, that the name is not a proper one, and that "surgical cure" should be substituted for it. This is no better, for we have no evidence yet that the cases *are* cured, or are not. The longer the period of observation to which the cases are subjected, the fewer are the "cures," the more the relapses. But there is no question that the condition of many of the patients is greatly improved even if they are not curéd. In this connection I would once more call attention to the large number of irreducible herniae among my cases—thirty-one out of seventy-two, or nearly one half. A relapse to these patients means a reducible and controllable hernia, in short, a fairly safe condition in place of one that was attended with risk.

But although my trials of the methods mentioned have not been satisfactory so far as a cure was concerned, I have not lost any enthusiasm in the cause. In a century which has seen so many seeming impossibilities converted into surgical triumphs, it is not too much to expect that much better results will be gained in the treatment of hernia. In the series of cases which I have operated on during the last

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year I have followed a plan for closure of the canal similar to that of Macewen combined with the ligature of the sac at its neck. If the result of this series prove disappointing, I shall try another method.

Barker's operation, as well as that of Ball, seems to be, on theoretical grounds, the most promising. Both aim to obliterate the sac high up without splitting the anterior wall of the canal, as in Risal's method, and to secure a narrowing of the canal by some form of suture. They are, in one sense, imitations of the process which nature follows in the cases which, treated mechanically in childhood, result in cure. The protrusion is prevented by pressure from the outside, the peritoneal opening is gradually obliterated, and the canal gets narrower, longer, and more oblique with the growth of the child.

Riesel's procedure undoubtedly enables one to reach the neck of the sac, and to obliterate its cavity; but in order to do so, it cuts through one wall of the canal, and then relies on sutures to obtain a union of this strong aponeurotic wall. But these are not efficacious, as the record of the above opetions shows; and I question the wisdom of this step, and shall discard it in the future. If it be conceded that sutures will not hold this divided wall, is it not imprudent to divide it? It must make the barrier still weaker than before the operation, and leave, as the only obstacle to the escape of the hernia, the ligated and adherent peritonaeum. This division of the anterior wall of the canal is one objectionable feature of the method called the "open," which has been so admirably elaborated by Dr. McBurney; but in place of the uncertain sutures he endeavours to obtain a strong and narrow granulative cicatrix to reinforce or support the ligated peritonaeum. It is unquestionably an advantage of this operation that the open treatment reduces to a minimum the risk of septic complications; but its other features—the splitting of the canal, and the relying on the cicatrix to bring about strong union of the canal—are, I believe, marked disadvantages. I am not convinced that it is correct in principle, and

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I believe, when time has permitted its results to be tested, that it will be found defective in practice. It is certainly a perversion of our knowledge of the phenomena of repair to assume that the granulative cicatrix is stronger than that of primary union. There is no other region of the body, or any other operative wound, where surgeons of experience would act in accordance with this idea. If it be correct, one should give up the present operations for ruptured perinaeum, and in place of them make a large, open wound. The longer it was in healing the better would be the opportunity for the cicatrix, deprived of the weight of the pelvic viscera, to become strong and dense. In all incisions through the abdominal wall one would be less anxious to get primary union, for there would be less tendency to the occurrence of ventral hernia if a good cicatrix were left, and it would simplify the management of these wounds to smooth off the peritonaeum with a suture, and then to stitch the skin to the fascia transversalis, and leave the wound, plugged with gauze and supported by relaxation sutures, to granulate. I am sure such propositions would not be seriously discussed; and yet they are precisely analogous to the proposal contained in the open method. Who would think seriously of trying to make the umbilicus stronger by cutting out a disc of all the tissues exterior to the peritonaeum, and then trying to get a "strong" cicatrix by the methods proposed? It would surely invite the occurrence of hernia. Yet the internal abdominal ring is left in about that condition by this operation, supported by the peritonaeum within and the cicatrix outside it. It is true that dense and strong citatrices follow deep burns. They contract and make terrible deformities, but they are not subjected to the steady pressure which this hernia cicatrix must endure. They maintain their density because of the yielding character of the tissues about them, as in the flexures of the limbs. Let them be acted on by a steady pressure from beneath, and they will gradually yield, and from their defective blood supply ultimately atrophy and ulcerate. Nussbaum, several years ago, actually proposed to make this

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sort of cicatrix by applying the actual cautery to the inguinal canal after tying the sac. If the principle be sound, it is certainly the better procedure than that of the "open method." But I need not dwell on what seems to my mind a radical defect in this method, and one that, despite its thorough elaboration and able advocacy, should not be attempted till operations based on sounder principles have been thoroughly tried. It has not yet had time enough to be tested; and there are undoubtedly those who, differing in their convictions from myself, will give it a fair trial. It will not be out of place, however, for me to present some observations which I have made on cases which have relapsed after the radical cure. These have presented themselves at the Hospital for Ruptured and Crippled during the past nine months. The total number of such cases is forty-five, but only those can be utilized whose histories could be obtained from hospital records or operators' notes. Of these there are twenty-one,[1] and they show the following results: Ten of these have been operated on by the "open method"—seven inguinal, one femoral, and three double inguinal herniae. The shortest time of relapse was one month; the longest, eleven months; the average, a little over four months. Two have been operated on by Heaton's method, with relapse at two months and eighteen months. Four have been treated by ligature and excision, with relapse on the average at the end of one year, and one by Macewen's method, with relapse at seven months. One case, in which the sac was ligated and excised, and the pillars sutured, relapsed at the end of four years; another, subjected to "purse-suture" and inversion of the sac, recurred at the end of five years; while two, in which the neck of the sac was sutured and the wound closed over the open canal, relapsed at the end of four and five months respectively.

Here are ten relapsed cases after the open method which have presented themselves within nine months at one institution. The proportion of relapses after this, compared to

[1] See Table C.

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those after other operations, has naturally no significance whatever; but the observance of these cases has served to strengthen my conviction that the open method will be found quite as defective as others. But some observations have been made on the condition of these relapsed cases, which have an important bearing on the relative merits of the closed and open methods. Most patients have presented themselves with but slight protrusions, presenting no points of interest. All of these could be easily fitted with a truss. In others the protrusions have been large, and in these there is a marked difference between the subjects of the open and the closed operation. Where the wound has been closed there is found beneath a linear soft cicatrix, a soft movable substratum overlying the hernial orifice: the orifice itself is small, and the patients endure the pad-pressure of the truss with comfort. The open cases, on the other hand, have large elongated hernial orifices corresponding in length to the extent to which the cicatrix has given way.

These orifices have to the feel no other covering than the thin atrophying cicatrix through which the movements of the intestine have been seen. A similar condition has been mentioned by Dr. J. Ford Thompson, at the discussion on Dr. Martin's paper, already referred to. An umbilical hernia was operated on, and primary union failed. The wound gaped so as to expose the peritonaeum, and then slowly cicatrised. For six months this was firm. Then the hernia relapsed, and its external covering was so thin that one could see the gut. Such a condition is by no means so favourable for mechanical treatment as those resulting from the closed operations. In all of these the effort is made to restore the parts to their natural condition. The walls of the abdomen at the site of the inguinal canal, which consist of several layers of tissue, when cut through, are united by the best cicatrix that our art can produce. With the open method, on the other hand, the abdominal wall at its weakest part is reduced by suture to a layer consisting of peritonaeum and transversalis fascia only, supported by the uncertain strength

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of a scar. The yielding of the deeper structures in the closed operation still leaves the skin and superficial gut and fascia to cover the protrusion and withstand the pressure of the truss. The yielding of the open wound cicatrix leaves the viscera in a most unprotected condition, for the cicatrix has ceased to hold them in, and it cannot itself bear the pressure of a mechanical support. In the one case, a failure to cure radically leaves the patient no worse than before; in the other, I fear that time will show that his unfortunate condition has been materially aggravated.

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TABLE A.

CASES OF REDUCIBLE AND IRREDUCIBLE HERNIA IN WHICH RADICAL CURE WAS ATTEMPTED.

	Age.				
1. Eugene M. H. of R. April 8, 1883.	30	Inguinal.	Ligature and removal of sac. Removal of omentum.	Cured. 31 days. Granulation.	
2. Mary McG. N. Y. H. March 3, 1884.	55	Irreducible inguinal. 3 years. Size of hen's egg.	Ligature of sac. Removal of omentum.	Cured. 58 days. Granulation.	
3. John A. N. Y. H. July 7, 1884.	80	Double inguinal. Right. 25 years. Size of hen's egg. Hydrocele. 2 years.	Ligature and removal of sac. Removal of omentum. At same time radical operation for hydrocele.	Died.	Bleeding into peritoneal cavity from an atheromatous artery.
4. Frank G. N. Y. H. Sept. 11, 1884.	40	Inguinal. Size of orange.	Ligature of sac.	Cured. 15 days. 1° union.	
5. William G. N. Y. H. Oct. 27, 1884.	5	Partly reducible. Inguinal. 4 months. Size of pigeon's egg.	Ligature of sac. Adherent vermiform appendix and omentum removed.	Cured. 12 days. 1° union.	Feb., 1886 (died). No relapse in 14 months.
6. Thomas Mc. G. N. Y. H. Nov. 6, 1884.	46	Inguinal. 14 y'rs. Size of cocoanut. 1880, herniotomy for strangulated hernia. Relapse 2 days ago.	Ligature and removal of sac. Removal of omentum.	Cured. 18 days. 1° union.	May, 1889, relapse; 3½ years after operation.

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7. Helen W. N. Y. H. Dec. 9, 1884.	48	Partly reducible Femoral. 3 years. Size of horse-chestnut.	Ligature and removal of sac. Removal of omentum. Wound packed.	Cured. 37 days. 2° union.	July, 1886. No relapse in 18 months. No truss.
8. Mary S. N. Y. H. Dec. 10, 1884.	51	Irreducible femoral. 8 months. Size of egg.	Ligature and removal of sac. Removal of omentum.	Cured. 42 days. 2° union.	
9. Robert P. N. Y. H. Jan. 21, 1885.	55	Congenital inguinal. 8 or 9 years. Size of cocoanut.	Ligature and removal of sac.	Cured. 57 days. 2° union.	
10. Leonard R. N. Y. H. March 9, 1885.	35	Partly reducible inguinal. 15 years.	Ligature and removal of sac. Removal of omentum.	Cured. 20 days. 1° union.	
11. F. O. N. Y. H. June 12, 1885.	14	Inguinal. Size of egg. Heaton's method failed.	Ligature and removal of sac. Suture of ring. Removal of omentum.	Cured. 19 days. 1° union.	July, 1886. Relapse. 1 year. Truss worn.
12. Mary B. N. Y. H. June 29, 1885.	33	Irreducible femoral. 1 year. Size of egg. Hernia, 5 years.	Ligature and removal of sac. Removal of omentum.	Cured. 32 days. 2° union.	July, 1886. No relapse for 11 months. Truss, 10 months.
13. Henry C. N. Y. H. June 30, 1885.	18	Congenital irreducible inguinal. Size of hen's egg.	Ligature and removal of sac. Removal of omentum.	Cured. 34 days. 2° union.	
14. Wm. McC. N. Y. H. July 9, 1885.	45	Inguinal (left). 3 years. Size of cocoanut.	Ligature and removal of sac. Suture of ring.	Cured. 15 days. 2° union.	

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TABLE A.—*Continued.*

	Age.				
15. Wm. McC. N. Y. H. July 24, 1885.	45	Inguinal (right). 1 year. Size of cocoanut.	Ligature and removal of sac. Suture of ring.	Cured.	
16. Thomas L. N. Y. H. July 27, 1885.	49	Irreducible inguinal. 6 years. Size of turkey's egg. Fibroid of uterus.	Ligature and removal of sac.	Cured. 39 days. 2° union.	
17. Wm. B. N. Y. H. August 4, 1885.	31	Partly reducible inguinal. Very large.	Ligature and removal of sac. Removal of omentum.	Cured. 55 days. 2° union.	July, 1889. No relapse in 4 years. Truss.
18. Francis M. N. Y. H. August 13, 1885.	39	Irreducible inguinal, 1 year. Hernia, 15 years. Strangulated 2½ hours, but reducible by taxis. Size of cocoanut.	Ligature and removal of sac.	Cured. 39 days. 2° union.	
19. Peter O. N. Y. H. August 25, 1885.	28	Inguinal. 3 years. Heaton's method failed twice.	Ligature and removal of sac. Removal of omentum.	Cured. 13 days. 1° union.	August, 1889. No relapse in 4 years. Truss up to a short time ago.
20. Camilla S. N. Y. H. Sept. 18, 1885.	29	Femoral. 2 months. Size of horse-chestnut.	Ligature and removal of sac.	Cured. 12 days. 1° union.	July, 1886. No relapse in 10 months. No truss.
21. John A. H. of R. Nov. 17, 1885.	23	Inguinal.	Ligature and removal of sac. Removal of omentum.	Cured. 2° union.	

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22. Ann M. 40 N. Y. H. Nov. 23, 1885.	Irreducible femoral. 2 years. Size of horse-chestnut.	Ligature and removal of sac. Stump sutured to ring. Removal of omentum. Wound packed.	Cured. 39 days. 2° union.	
23. Alfred C. 36 H. of R. Dec. 28, 1885.	Inguinal, 4 years.	Ligature and removal of sac. Suture of ring.	Cured. 2° union.	
24. Grace W. 61 H. of R. Jan. 16, 1886.	Irreducible femoral. Hydrocele of sac.	Ligature and removal of sac. Removal of omentum.	Cured. 1° union.	
25. Jeremiah C. 46 N. Y. H. Feb. 26, 1886.	Inguinal. 3 years. Size of hen's egg.	Ligature and removal of sac. Suture of ring.	Cured. 27 days. 1° union.	August, 1889. Relapsed. 3 years and 4 months.
26. N. O'S. 63 N. Y. H. March 11, 1886.	Congenital irreducible inguinal. 1 year. Hernia, 10 years.	Ligature and removal of sac. Suture of ring. Removal of omentum.	Cured. 42 days. 1° union.	February, 1888. (1 year 9 months.) No relapse.
27. Thomas E. 43 N. Y. H. July 31, 1886.	Partly reducible inguinal. 11 years. Size of fist.	Ligature and removal of sac. Suture of ring.	Cured. 36 days. 2° union.	
28. Charles W. 36 N. Y. H. August 3, 1886.	Irreducible inguinal. 5 years.	Ligature and removal of sac. Omentum removed. Stump bled and drawn out of peritoneal cavity, and vessels tied.	Died. 24 hours.	Autopsy disclosed congestion of intestine and bloody serum in pelvis. Septic peritonitis.
29. Lazarus B. 45 N. Y. H. August 6, 1886.	Inguinal. 34 years. Size of fist.	Ligature and removal of sac. Suture of ring.	Cured. 25 days.	

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TABLE A.—*Continued.*

	Age.					
30. George W. N. Y. H. August 17, 1886.	31	Incarcerated inguinal. 3 years. Size of two fists.	Ligature and removal of sac. Suture of ring.	Cured. 34 days.		
31. James S. N. Y. H. Sept. 17, 1886.	23	Inguinal. Size of hen's egg.	Suture of ring. No sac found. Wound loosely closed.	Cured. 36 days.	2° union.	October, 1887. Relapse. (1 year.)
32. Adam T. N. Y. H. Sept. 25, 1886.		Inguinal. 25 years.	Ligature and removal of sac. Suture of ring. Omentum removed.	Cured. 49 days.	1° union.	July, 1889. Relapse 13 months.
33. James L. N. Y. H. Feb. 26, 1887.		Inguinal. 2 months. Size of fist. Heaton's method failed.	Ligature and removal of sac. Suture of ring.	Cured. 16 days.	1° union.	
34. Dominick T. N. Y. H. March 16, 1887.	29	Irreducible ventral. 5 years. Size of horse-chestnut.	Suture of ring. Removal of omentum.	Cured. 16 days.	1° union.	
35. Wm. W. N. Y. H. May 11, 1887.	20	Inguinal. 8 months. Size of hen's egg.	Ligature and removal of sac. Removal of omentum.	Cured. 42 days.	1° union.	
36. Wm. M. N. Y. H. June 11, 1887.	25	Congenital irreducible inguinal. 1 day. Size of egg. Hernia several years.	Ligature and removal of sac. Suture of ring. Cyst of cord opened.	Cured. 21 days.		July 1, 1889. No relapse in 2 years. No truss.
37. Edward F. N. Y. H. July 14, 1887.	46	Ventral. 12 years. Size of almond.	Suture of ring. Removal of omentum.	Cured. 38 days.	2° union.	January, 1889. No relapse in 16 months.

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38. Henry O. N. Y. H. August 1, 1887.	50	Inguinal. 26 years.	Ligature and removal of sac. Suture of ring.	Cured. 25 days. 1° union.	
39. Henry C. N. Y. H. Sept. 2, 1887.	59	Irreducible inguinal. 20 years.	Suture of neck of sac. Contained sigmoid flexure.	Cured. 25 days. 1° union.	Relapsed in 1 month.
40. Charles B. N. Y. H. Sept. 5, 1887.	41	Irreducible inguinal. 15 years. Size of fist.	Ligature and removal of sac. Suture of ring. Removal of omentum.	Cured. 19 days. 1° union.	February, 1889. No relapse in 16 mo's. Truss.
41. John M. N. Y. H. Oct. 4, 1887.	22	Inguinal. 4 years. Size of two fists.	Ligature and removal of sac, and edges sewn to ring. Suture of ring.	Cured. 37 days. 2° union.	
42. Philip H. N. Y. H. Oct. 5, 1887.	48	Inguinal. 17 years. Size of hen's egg.	Lig. and removal of sac. Suture of edges of sac to ring. Suture of ring.	Cured. 11 days. 1° union.	December, 1888. Relapsed in 6 months.
43. James M'D. N. Y. H. Dec. 15, 1887.	35	Inguinal. 20 years. Radical cure 2 years ago. Relapse previous day.	Ligature and removal of sac. Suture of ring. Removal of omentum.	Cured. 39 days. 2° union.	July, 1888. Relapsed in 6 months.
44. Francis T. N. Y. H. Jan. 12, 1888.	43	Inguinal. 6 weeks.	Ligature and removal of sac. Suture of ring.	Cured. 36 days. 2° union.	August, 1889. No relapse in 17 mo's.
45. Arthur H. N. Y. H. Jan. 12, 1888.	25	Inguinal. 19 years. Size of fist.	Ligature and removal of sac. Suture of ring.	Cured. 22 days. 1° union.	January, 1889. No relapse in 11 mo's. Truss.

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TABLE A.—*Continued.*

	Age.					
46. Wm. H. N. Y. H. May 3, 1888.	28	Inguinal. 7 years.	Ligature and removal of sac. Suture of ring.	Cured. 27 days.	1° union.	
47. John H. N. Y. H. May 15, 1888.	35	Inguinal. 16 years.	Ligature and removal of sac. Removal of omentum.	Cured. 51 days.		January, 1889. No relapse in 5 mo's. No truss.
48. Joseph E. N. Y. H. May 19, 1888.	20	Irreducible inguinal. 5 years.	Ligature and removal of sac. Removal of omentum.	Cured. 24 days.		July, 1889. No relapse in 12 months. Truss.
49. Thomas S. N. Y. H. June 5, 1888.	47	Irreducible inguinal, 6 months. Hernia, 4 years. Hydrocele.	Lig. and removal of sac. Tubercular abscess of Mesentery. Intestines wounded in breaking up adhesions. Drainage (glass) of abdominal cavity.	Cured. 38 days.	2° union.	October, 1888. Relapse 3 months. No truss.
50. John R. N. Y. H. June 19, 1888.	19	Partly reducible inguinal. 1½ years.	Ligature and removal of sac. Suture of ring. Removal of omentum.	Cured. 18 days.	1° union.	July, 1889. No relapse in 1 year. Truss.
51. John H. N. Y. H. June 25, 1888.	26	Irreducible inguinal, 1 week. Hernia, 2½ years.	Ligature and removal of sac. Suture of ring. Removal of omentum.	Cured. 18 days.	1° union.	August, 1889. No relapse in 13 mo's. No truss.
52. Michael T. N. Y. H. June 25, 1888.	45	Inguinal. 10 years. Size of child's head.	Ligature of sac. Suture of ring.	Cured. 24 days.	1° union.	

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53. Perkins M. 24 N. Y. H. July 16, 1888.	Irreducible inguinal, 1 month. Hernia, 2 years.	Lig. and removal of sac. Suture of ring. Removal of omentum. Middle portion of wound packed.	Cured. 28 days.	2° union.	
54. Michael C. 55 N. Y. H. July 18, 1888.	Congenital irreducible inguinal. 4 days.	Lig. and removal of sacs. Two sacs found. Removal of omentum. Wound left open.	Cured. 35 days.	2° union.	January, 1889. Relapse, 3 months.
55. Mary C. 76 N. Y. H. July 26, 1888.	Irreducible femoral. 13 years. Size of walnut.	Ligature and removal of sac. Wound treated openly.	Cured. 18 days.	2° union.	January, 1889. Relapse, 5 months. No truss.
56. Arthur W. 23 N. Y. H. August 4, 1888.	Irreducible inguinal, 2 days. Hernia, 8 years.	Ligature and removal of sac. Suture of ring. Removal of omentum.	Cured. 16 days.	1° union.	August, 1889. No relapse in 1 year. No truss.
57. James D. 55 N. Y. H. August 27, 1888.	Partly reducible ventral. 4 years. Size of fist.	Suture of ring. Removal of omentum.	Cured. 10 days.	1° union.	January, 1889. Relapse, 4 months.
58. Charles B. 38 N. Y. H. Sept. 1, 1888.	Inguinal. 7½ years. Size of child's head. Heaton's method failed.	Ligature and removal of sac. Suture of ring.	Cured. 41 days.	2° union.	January, 1889. No relapse in 6 months. Truss.
59. Christian W. 51 N. Y. H. Sept. 3, 1888.	Irreducible inguinal. 8 days. Hernia, 35 years.	Lig. and removal of sac. Removal of vermiform appendix and omentum.	Cured. 28 days.		August, 1889. Relapse, 10 months.
60. Mary S. 60 N. Y. H. Sept. 15, 1888.	Irreducible femoral. 4 years. Size of fist.	Ligature and removal of sac. Removal of omentum.	Cured. 17 days.	1° union.	

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TABLE B.

CASES OF STRANGULATED HERNIA IN WHICH THE RADICAL CURE WAS ATTEMPTED.

	Age.				
61. Henry M. N. Y. H. August 13, 1883.	32	Congenital inguinal. 2 or 3 hours. Hernia, 12 years.	Ligature and removal of sac.	Cured. 12 days. 1° union.	
62. Eva E. N. Y. H. May 25, 1884.	58	Inguinal, 2 days. Hernia, 30 years. Size of fist.	Ligature and removal of sac.	Cured. 12 days. 1° union.	
63. Clara D. N. Y. H. Jan. 23, 1885.	61	Femoral, 8 days. Hernia, 10 years. Size of egg.	Ligature and removal of sac.	Cured. 31 days.	August, 1886. Relapse, 17 months. Truss.
64. Elizabeth H. N. Y. H. Jan. 29, 1885.	36	Femoral. Hernia, 8 years. Size of egg.	Ligature and removal of sac.	Cured. 26 days. 2° union.	July, 1886. Relapse, 16 months. Truss.
65. George S. N. Y. H. Feb. 15, 1885.	23	Congenital inguinal, 1 day. Hernia, 5 years. Radical cure 1 year ago. No relapse until 1 day ago.	Ligature and removal of sac.	Cured. 46 days. 2° union. Pneumonia.	January, 1886. No relapse in 9 months. No truss.
66. Mary D. N. Y. H. June 16, 1886.	60	Femoral, 3 days. Hernia, 3 years. Size of walnut.	Ligature and removal of sac. Removal of omentum.	Cured. 12 days. 1° union.	
67. Matthieu C. N. Y. H. Sept. 5, 1886.	71	Inguinal, 12 hours. Hernia, 12 years. Size of hen's egg.	Ligature and removal of sac. Wound treated openly. Cocoaine.	Cured. 31 days. 2° union.	July, 1889. No relapse in 2 years and 9 months. No truss.

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68. Gibson K. 59 N. Y. H. July 17, 1887.	Inguinal, 1 day. Hernia, 2 years. Size of cocoanut. Hydrocele.	Ligature and removal of sac. Suture of ring.	Died. 12 hours.	Shock.
69. Edward C. 25 N. Y. H. July 26, 1887.	Congenital inguinal. 2 days.	Ligature and removal of sac. Suture of ring.	Cured. 14 days. 1° union.	February, 1889. Relapse 8 months later.
70. Walter S. 22 N. Y. H. August 2, 1887.	Inguinal, 3 days. Hernia, 10 years. Size of pear.	Ligature and removal of sac. Suture of ring. Removal of omentum.	Cured. 32 days.	January, 1889. No relapse in 16 mo's. No truss.
71. Bridget K. 37 N. Y. H. July 14, 1888.	Femoral, 24 hours. Hernia, 6 years.	Ligature and removal of sac. Removal of omentum.	Cured. 13 days. 1° union.	January, 1889. No relapse in 5 months. Truss.
72. Henry G. 22 N. Y. H. August 4, 1888.	Congenital inguinal. 4 hours.	Suture of ring. Sac not removed.	Cured. 22 days. 1° union.	June 1, 1889. No relapse in 9 months.

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TABLE C.

CASES OF HERNIA RELAPSING AFTER THE RADICAL OPERATION.

OBSERVED AT THE HOSPITAL FOR RUPTURED AND CRIPPLED.

Name. Age. Hospital.	Date.	Nature of Hernia.	Operation.	Date of Relapse.
1. Diabella. St. Luke's.	November 24, 1888.	Inguinal reducible.	Open.	1 month.
2. Jose. St. Luke's.	September 2, 1888.	Inguinal reducible.	Open.	7 weeks. No truss.
3. O'Brien. 40 St. Luke's.	August 21, 1888.	Double reducible inguinal.	Open, both sides at once.	3 months. Truss.
4. Eussen. 35 St. Luke's.	April 12, 1881.	Femoral irreducible.	Helotomy. Ligature of sac.	18 months. No truss.
5. Orthmann. 39 St. Luke's.	February 22, 1888.	Inguinal reducible.	Macewen.	Truss from 5 months after operation. Relapse 2 months later.
6. Connor. 50 St. Luke's.	June, 1888.	Inguinal.	Open.	2 months. Truss.
7. Corea. St. Luke's.	August 27, 1888.	Inguinal. Double.	Open, both sides.	7 weeks.
8. Kulsen. 43 Presbyterian.	June, 1888.	Inguinal. Large.	Open. Wound torn open and intestines protruded by patient's springing out of bed. Sac and skin sutured.	4 months. No truss.
9. Buck. Roosevelt.	April 9, 1887.	Inguinal, incomplete.	Ligature and suture of ring.	2 years. Truss.

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10. Palmer. N. Y. H.		October 8, 1887.	Scrotal, irreducible.	Suture of neck of sac. Wound left open.	5 weeks.
11. Huplein. Post Graduate H'p't'l.		September 25, 1887.	Femoral.	Open.	7 months. No truss.
12. Mary C. N. Y. H.	74	July 23, 1888.	Femoral irreducible.	Ligature and excision.	5 months. No truss.
13. James H. Private.	32	May, 1886.	Inguinal.	Heaton.	18 months. Truss.
14. Patrick T. Bellevue.	38	March 2, 1888.	Inguinal.	Macewen.	3 months. No truss.
15. Harrigan. St. Luke's.	38	February, 1887.	Inguinal.	Heaton.	2 months. Truss.
16. Miller. St. Luke's.		August, 1888.	Inguinal reducible.	Open.	3 months.
17. Lizzie H. N. Y. H.		1885.	Femoral strangulated.	Ligature and excision.	1 month. No truss.
18. Oagley. Roosevelt.	28	November, 1888.	Inguinal, double.	Open.	1 month. No truss.
19. Donnelly. Roosevelt.	61	November, 1888 (about).	Inguinal.	Open.	2 months. No truss.
20. Frank. Mt. Sinai.		1884.	Inguinal.	"Purse suture and inversion of sac."	5 years. No truss.
21. Connolly. Bellevue.	45	July 13, 1886.	Inguinal.	Ligature of sac. Suture of ring.	4 years. No truss.

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GENERAL DISCUSSION.

[From Stenographic Report.]

DR. WILLIAM DETMOLD, of New York county, said that he believed life insurance companies required of every policy-holder who had or had had a hernia a pledge that he would never leave off his truss. If the policy-holder died of strangulated hernia, his insurance was forfeited.

In the American edition of Cooper's Surgical Dictionary, 1842, there is an account of an operation for hernia performed in 1837, fifty-two years ago, by the speaker. A young woman called at his office and asked him whether a hernia could be cured by operation. This was before the days of medical libraries and trustworthy journals, and he had no precedent upon which to base an opinion, but, yielding to her entreaties, he finally consented to perform an operation. He consulted Dr. Alexander H. Stevens, but the latter considered the operation unjustifiable, and declined his assistance. The hernia was a small femoral one, the sac too small to be tied. He laid the crural canal bare, scarified the upper portion, avoiding the vessels, and kept the wound filled with lint for several weeks. The hernia was cured and remained so for five years, when the patient was removed from observation. No truss was used after the operation, the speaker feeling that it would tend to promote absorption and a recurrence of the hernia.

DR. H. O. MARCY, of Boston, Mass., said that he would like to touch upon a few points which he considered of the utmost importance, and for that purpose would review the treatment of an illustrative case of inguinal hernia. Two hundred years ago such cases were surgically treated in Europe with success, but the testicle was sacrificed. So many cases were operated upon at this cost that the procedure was finally stopped by royal edict. At the present time we have not advanced much beyond the point then reached. The problem is still the closing of a canal while leaving it open. Nature must be our guide in the solution of this problem. She has provided an opening which, like that of the ureter into the bladder, permits a flow in only one direction. The more distended the bladder, the more firmly are the ureteric orifices closed. In like manner intra-abdominal pressure closes the normal inguinal canal. In both cases the *obliquity* of the canal is the necessary condition to the accomplishment of the object desired. If we would cure an inguinal hernia, we must restore the obliquity of the canal.

Dr. Marcy then referred to the operation which had become associated with his name. He said that he believed it absolutely necessary to remove the sac; yet, like all rules, this one may have its exceptions. In the infant the sac is unimportant because so small. Even in cases of strangulation the sac may be so small that its removal is not a necessity. If it is to

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be closed, it may be done by stitches following the oblique direction of the canal, and then the sac returned within the abdominal cavity. Beyond this the sac requires no treatment. The next step is the restoration of the canal. For this purpose he considered wire or silk sutures inappropriate, because the suture should be buried, and for this purpose only animal sutures—catgut, or, preferably, tendon sutures—should be used. The obliquity of the canal should be restored by closing in the canal up to its internal and superior borders, having replaced the cord in its normal position. The objection the speaker had to the operation of Dr. Bryant was, that it did not restore the obliquity of the canal, but depended upon a suture, the efficiency of which must necessarily be of short duration. A buried animal suture causes a proliferation of the connective tissue cells, forming a new tissue replacing both the suture and the tissues in its immediate vicinity, and possessing a surprising firmness of structure. After making these deep sutures he was in the habit of closing the more superficial tissues in two layers, and then the skin by a fourth set of buried sutures. The whole is then covered by a film of iodoform collodion, which secures the maximum safety with but little trouble. If the operation has been aseptic, this dressing will prove satisfactory. To wrap the patient in a bulky dressing so that he resembles a mummy does not insure safety. He will be likely to displace it. The aseptic collodion he cannot displace. He did not find it necessary to keep the patient in bed after the operation.

Contrary to the opinions expressed in most of the papers, he would advise operating on children, because the operation is then comparatively simple, and the patients are saved a great amount of future suffering, and, perhaps, lifelong disability. He thought all cases of irreducible hernia should be operated on, and also all cases finding trouble in wearing a truss. One of the greatest difficulties to be contended with is the reluctance of the family physician to advise an operation. It takes a long time to educate the family physician, and most people fear operations. In many cases taxis is employed until the parts are reduced to such a state that the difficulties of an operation are greatly increased.

Dr. Marcy then stated that he had operated at all ages, from seventeen months to eighty years, on about one hundred cases, and in no instance had he felt any alarm for the patient. He had compiled statistics of between seven and eight hundred cases, among which there were but five deaths, in every case expressly attributed to the condition of the intestine.

As to the permanency of the results, Dr. Marcy said that he had had the same difficulty in following the histories of his patients subsequent to the operation that the other speakers had experienced, but he was confident that in fully ninety per cent. the cure had been permanent. He had never advised the use of a truss after the operation. He consid-

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ered its use a source of danger, rather than an aid to permanent success.

So much had already been said against the open method of treating hernia that he would not reiterate the objections already advanced. An operation resulting in a primary union of the parts should be the result striven for.

Dr. H. D. Didama, of Onondaga county, said that if, instead of an operation confining the patient in bed six weeks, it were possible to do an operation confining him only forty-eight hours, other things being equal, the shorter operation should be preferred. If a natural tissue can be secured to retain the intestine instead of a cicatrix, it were better to have the natural tissue. If suppuration can always be avoided by the use of catgut, or silk, or silk-worm gut, let us use them. If it is possible to avoid oedema and pain, let us do so. He had seen Dr. Marcy operate on six or seven cases of strangulated hernia, and the patients were up and about in twenty-four to forty-eight hours without inconvenience. If he had these favourable results, why consider other operations?

Dr. S. T. Armstrong thought that the closed method failed to restore the inguinal canal to its normal condition, because the fibres of the transversalis and internal oblique muscles were irrevocably lost, and no efficient substitute for them provided. In his cases he had always employed the open method, striving to produce a thick cicatrix of great firmness. In some cases the scar had been from a quarter to half an inch thick, and made the wearing of a truss unnecessary. The speaker's own cases he considered too recent to throw light on the ultimate results of this method.

Dr. Van Dorran said that some years ago he had had the fortune to think he had discovered something relative to the cure of hernia. His plan had been to obliterate the sac by occluding its orifice, and producing a scar which should mat together a number of tissues enclosed in a common suture. This suture was to pass beneath the skin, through the columns and the neck of the sac, around the latter, and finally draw all these structures together. He had operated in this way on some thirty-four cases, but before long there had been recurrences of the herniae, and he had concluded that the fault of the operation lay in its attempting to cause firm union between heterologous structures. Success, he thought, depended upon bringing together tissues of like nature and causing them to unite. Dr. Marcy's method of operating accomplished this. The speaker thought, however, that there were cases in which Dr. Marcy's operation would fail. These were such as had used a badly fitting truss, or had had a hernia of long standing, resulting in an attenuation of the tissues and a reduction of their vitality so that they could no longer furnish a tissue of sufficient firmness, even after their union.

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He called attention again to a class of cases which recover upon the use of an apparatus. These are cases of recent hernia, and an organic union of the walls is effected. In chronic cases of hernia the tissues have become fibrous, and their vitality so reduced that a firm union can no longer be looked for. In a class of cases intermediate to these two the operation of Dr. Marcy's is especially applicable.

Dr. T. H. Manley, of New York county, called attention to the probable fact that the majority of cases of hernia were of congenital origin, in the sense that there was a weakness from birth which permitted the formation of a hernia as the result of bodily strain. With reference to the various operations, he thought that individual cases of hernia differed so greatly that the appropriate operation must be selected to meet the special conditions presented.

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QUESTION IV.

WHAT MEDICINAL AND MANIPULATIVE METHODS DO YOU RECOMMEND FOR STRANGULATED HERNIA, AND WHAT RELIANCE DO YOU PLACE ON THEM?

Discussed by

D. M. TOTMAN, M. D., of Onondaga County.
LEROY J. BROOKS, M. D., of Chenango County.

DR. D. M. TOTMAN.

"As all the symptoms originate from the compressed state of the protruded parts, it must be the surgeon's object to return them as soon as possible into the cavity of the abdomen; and he is only wasting time by any attempt to alleviate the violence of the symptoms independent of this principal object." This sentence, taken from Sir Astley Cooper's work on hernia, so plainly expresses the object of the surgeon that I take it as a text, using the following histories of two cases as illustrations:

CASE I. A healthy and vigourous man, aet. 22, while lifting a basket of fruit from a high delivery wagon, felt a sharp pain in the abdomen, and knew that his hernia had come down in some unusual manner. A physician was called, and an unsuccessful attempt at reduction was made. One hour after the strangulation began the case was placed in my care.

The patient was suffering extreme pain; had vomited once or twice; the tumor in the right inguinal region was tense and unyielding to manual pressure. The history showed that this breach had begun six years before, and that the only previous time the patient had had trouble was about four years before, under quite similar conditions to those then presented, and that at that time the hernia had resisted all efforts at reduction until the fourth day, when a spontaneous reduction had

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occurred. Considering this history, I ordered the patient to take two grains of powdered opium, and to lie upon his back, with his limbs flexed over a large pillow, and to have cloths taken out of hot water constantly applied over the tumor. Three hours later, the patient not being thoroughly narcotised, I ordered the opium repeated. Two hours after this, the patient then being thoroughly narcotised, a firm and steady manipulation of a few minutes' duration reduced the tumor. The duration of the strangulation was six hours.

Case II. W. C., aet. 52, in January last went with an ambulance upon an urgent call. He jumped from the ambulance, and slipped as he struck the ground. He immediately felt a severe pain in the region of his stomach. He was carried into a near drug store, where the nature of the injury was discovered to be an inguinal hernia on the right side. Two physicians were summoned, chloroform was administered, and an unsuccessful attempt made to reduce the hernia. The patient was then sent to the hospital, where he came under my care. When seen two hours after the injury he was in profound shock, with collapse imminent. The history showed that while in the army he had some little trouble with a breach in the right inguinal region. It had never troubled him since, and he had quite forgotten about it.

One third of a grain of morphine was administered hypodermically, and immediately afterwards the patient was placed upon the table and herniotomy was performed. The gut was of a dark mahogany colour, and was kept nearly one half hour in hot towels before the circulation was reëstablished.

My first case proves that success followed legitimately on the use of opium, hot water, and taxis. My second case proves that neither opium nor any other medicinal agent, nor manipulative procedure of any kind, would have succeeded.

Between these two sorts of cases lie the great majority, and there can be no fixed rule of action. Each case must be dealt with according to its own requirements. In the treatment of my first case I believe I acted wisely. In the second case I know positively that I did so.

Therefore the conclusion that opium, hot or cold water, and manipulation are of the greatest value in appropriate cases; and also the conclusion that there are other cases where the delay necessary for the employment of opium or manipulative procedures is wholly unjustifiable.

I therefore repeat Sir Astley Cooper's words, that the sur-

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geon is only wasting time by any attempt to alleviate the violence of the symptoms independent of this principal object,—the return of the protruded parts into the cavity of the abdomen.

DR. LEROY J. BROOKS.

It is a source of astonishment to find how large a number of cases of strangulated hernia are reported as relieved by "manipulative and palliative measures," even when of long duration, and after being "condemned to operation" by the surgeons. In conversations with older and more conservative physicians, we find many of them in full accord with Gross, when he says he is certain that "almost every hernia, however severely strangulated, may be safely and expeditiously reduced without operation."

A physician of almost fifty years' experience informed me that he had failed to reduce the strangulated parts without operation in only two or three instances, and that he had operated in but a single case. Also, that he had not had more than two deaths that could be attributed to the strangulation.

It is hardly in the province of this discussion to enter into the details of the variety of means recommended, or reported as successful, in the treatment of strangulated hernia. Many of them have properly been replaced by more convenient, safer, and more intelligent measures. It is understood that in nearly all the methods, taxis, appropriate to the location and character of the protrusion, is a part of the treatment. It is not necessary to present rules for such taxis, more than to express the belief that if it is intelligently applied for twenty minutes, under favourable circumstances, without success, it is useless, and to continue it ordinarily does more harm than good. When, as in some recent experiences, we operate upon cases which have been subjected to from two to six hours of persistent and forcible taxis, and find both sac and intestine irrecoverably injured, there is scarce a need of further argument. Where prolonged taxis saves one patient, it kills a dozen.

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An examination of such literature as I have at my command shows a great variety of so called successful methods of treatment. Among them I mention,—

Opium or morphine.
Belladonna internally and in enemata.
Tobacco enemata.
Coffee enemata.
Ergotine (injected over the sac).
Exhaustion of air from the colon.
Abdominal traction.
Cold baths.
Cold irrigation.
Cold applications—ice, ether, etc.
Aspiration.
Acupuncture.
Anaesthesia.
Postural treatment—Hesselbach's position.
" " Inversion of the body.
" " Knee, shoulder position.
Cupping the abdomen.
Distension of the colon by large aqueous enemata.
Dilating the ring. Sentin's method.
Hot applications and hot baths.

This list is not offered as any approximation to a complete one, but suffices as an index to the variety and relative value of the proposed methods. Only such measures as fulfil the following requirements can be recommended:

(1) That will not injure the intestines or adjacent parts by their immediate application.

(2) That will not prolong unjustifiably the strangulation.

(3) That will not interfere with subsequent operation, nor increase the danger to the intestine after operation.

(4) That will not unfit the patient for operative procedure by increasing exhaustion, shock, or vomiting.

These rules readily exclude many of the foregoing methods, as being slow, deceptive, or likely to increase the local or

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general danger. The use of nauseating or depressing enemata or internal remedies may be excluded, because anaesthesia will meet all requirements in a safer way.

Such measures as over-distension of the colon by air or gas, abdominal traction, violent and prolonged taxis, acupuncture, abdominal cupping, exhaustion of air from the colon, ergotine injections, distension of the colon by large aqueous enemata, may also be excluded except under the most extraordinary circumstances, because safer and more efficient measures are usually at hand.

Worthy of more consideration are the following measures, which are applicable to many cases of strangulated hernia:

(1) Postural Treatment. It is in accordance with the popular sentiment, both lay and professional, to attribute value to position; and many cases are reported in which success was obtained by its employment where taxis without it, and in fact all other measures, had failed.

The usual position consists in an elevation of the hips and lower extremities, with the extremities well flexed upon the body; or the position described by Hesselbach, in which the knees are bent over the shoulders of another person, and the body allowed to hang inverted.

M. Kolaus reports several successes by what he describes as the knee and shoulder position, after other positions had failed. The body is placed with the femurs vertical, and the trunk resting upon the shoulder on the side of the protrusion.

It is evident that a proper position always assists reduction, cannot do harm, offers a reasonable hope of relief, particularly if assisted by taxis, does not cause delay, and is to be recommended for all cases.

(2) Morphine or opium. A full opiate, particularly if used hypodermically, relaxes the muscular spasm, blunts the sensitiveness of the patient, controls vomiting, allays nervous fear, and, not infrequently, permits an easy reduction of protrusions that before were beyond impressions.

(3) Hot baths. Complete immersion of the body, or, at

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least, the hips, in water as hot as can be borne, associated with taxis, offers the double inducement of a local relief of spasmodic action and a general relaxation of the system favourable to reduction.

(4) Aspiration. This procedure cannot be recommended with the same degree of assurance as the preceding, although a large number of cases are reported where relief was obtained after the failure of other methods.

It should be done with an aseptic needle of small size, and the tumor emptied if possible of both gases and liquids.

In my own experience I have never seen it of avail in a case of thoroughly strangulated hernia, and it is open to the possible danger of septic infection and extravasation of the fluids into the tissues.

(5) Emptying the intestinal tract by enemata of water does not cause delay nor do possible harm, and at the same time prepares the patient for operative measures and subsequent care. Successful reduction by taxis will occasionally follow this measure when taxis alone had previously failed.

(6) Anaesthesia probably facilitates successful reduction more often than any other measure, and replaces the older methods of aiding reduction by the use of nauseating and depressing enemata, and systemic nauseants. Anaesthetics should be used only when all necessary preparations for operative procedures have been made, so that if manipulation under the anaesthetic is not quickly successful the operation may be at once proceeded with.

(7) Ice and Cold Applications. So many cases are reported as being readily relieved by cold applications, such as ice, ether, cold effusions, and douches, that a reference to them appears necessary, although there is little reason to think that they possess any advantage over the relaxing hot baths; and it is probable that they have been successful only where the strangulation is of a lesser degree, and could have been reduced by other equally safe measures.

(8) Baron Sentin reports having been very successful in relieving the "strangulation" by gradual dilatation of the

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hernial constriction with the index finger. Roseberry, Stewart, and others report an aggregate of twelve successful cases treated in this way, most of them cases in which other measures had failed. The method appears available only in cases not firmly strangulated, and is open to the objection that there is danger of doing an injury to the protruded parts.

As the result of these considerations, the following general plan of treatment of strangulated henia may be commended:

(1) Give the patient a full dose of morphine.

(2) Empty the large intestine by an enema.

(3) Place the patient in a suitable posture.

(4) Use proper and intelligent taxis for a short time while the patient is in a hot bath.

(5) If these measures are not successful, administer an anaesthetic and repeat the taxis. If still unsuccessful, proceed at once to perform a suitable operation.

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THE USE AND ABUSE OF THE FORCEPS IN OBSTETRICS.

By J. P. Garrish, M.D., of New York County.

[Read by title.]

I shall not occupy your time with the early history of the forceps, nor with the various modifications they have undergone since their first introduction to the attention of the profession. Suffice it to say, that the obstetric arsenal, so far as the number and kinds of forceps it contains are concerned, is a formidable institution, and suggests that perhaps the interests of humanity had been more wisely served if some of the time employed in the construction and modification of this instrument had been given to the proper consideration of the more important question, Under what circumstances and in what manner are the forceps to be applied? If this question had received more mature deliberation, we should have been spared the numerous appalling examples of injury and death consequent upon the unbounded love which some practitioners have for instrumental delivery. It is time that plain language be spoken on this all-important subject. The spirit of conservatism seems to have been lost in sleep. The ordinances of nature have been disregarded. The accoucheur, with instrument in hand, rampant in his desire for opportunity, rushes with good heart and unmeasured confidence to what he deems the field of conquest, but which too often proves a scene of harrowing agony to the unfortunate patient. One would almost think that nature had become emasculated of her power, and that what were once considered her admirable laws had been so changed and so utterly deprived of force as to render parturition no longer an act of hers to be accomplished in her own inimitable way, but an

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act to be carried out according to the peculiar caprices of the accoucheur.

Nature is always the same, so far as her own fundamental laws are concerned. She is now, in this particular, what she was at the commencement of the world. I claim for her perfection of design, and unequalled skill in the display of her own efforts, when not contravened by morbid influences or the officiousness of man. It must, however, be conceded that she sometimes needs assistance, but that assistance, in order that it may be serviceable, should be both justifiable and opportune. There is no operation where brain and hand must work together so evenly as in the application of the forceps. Those who advocate the promiscuous, or at least the too frequent, use of the forceps are nearly all enthusiastic professors or teachers of obstetrics, men who do more harm in misleading inexperienced students in one hour than a dozen intelligent and experienced men outside of the schools can remedy in a century. I entertain no personal enmity towards them, but believe it my duty as an humble worker for the good of mankind to oppose, without fear or hesitation, that theory which an extensive practice in obstetrics has taught me to be wrong. If what I can say can check the unbridled enthusiasm of medical neophytes, or save the lives of a single mother and child, I shall not regret presenting this important theme for your mature and serious consideration. I do not write for the purpose of criticising other men's views, or of calling in question the mature judgment of men who are considered authorities, and whose fondness for the use of the forceps has given them a reputation with both the profession and the ladies.

It may be acknowledged that we are living in a decidedly fast age. Especially here in the United States it may be truly said that we are in a hurry over everything. The boy is in a hurry to become a man; the girl is in a hurry to become a woman; the woman is in a hurry to get married; and, although generally not in a hurry to become a mother, if she should, in spite of every precaution, find she is likely to

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become a mother, she is often in a hurry to have pulled out that which nature is pushing out as fast as she can.

Forceps should not be used without a moral justification of their use, and they should be so used as to secure the maximum benefit with the least risk to both mother and child. The forceps, skilfully employed, are undoubtedly a great boon to suffering woman. In certain cases many mothers and children have been rescued from premature graves by its judicious employment. I will admit that thousands of infants have been helped into the world by them, who, without their aid, must inevitably have perished. While, then, it must be evident to all that the obstetric forceps, properly and judiciously used, may be made to accomplish a great good, we are not justified in recommending them for common use. When so few cases demand its employment, may not the injury and destruction caused by their injudicious use more than counterbalance the good done by their promiscuous employment?

This is the point to which I desire to call your attention, and upon which I seek information: Are we justified in using, and recommending for use, instruments which, though comparatively harmless in skilled hands, are, in inexperienced hands, capable of inflicting such fearful injuries, when labour can be much better accomplished by the unassisted efforts of nature? Is it not an undeniable fact, that even among the most highly civilized and refined races, the cases of labour which absolutely demand instrumental interference are comparatively few? Indeed, with the exception of professors or specialists, few men of experience and exclusively private practice have to use the forceps once in four hundred labours, and some who have attended more than two thousand cases with success have never applied the forceps, nor lost any patient through not resorting to them.

Among the British practitioners in the hospitals the forceps are used in about one case in 240 deliveries, while the French use them once in 140 cases, the Germans once in 106 cases, with a mortality to mothers in Great Britain of one in 20

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cases, in France and Germany of one in 84. In the combined hospital and private practice of such men as Barns and Davis of London, the use of the forceps was rarely resorted to. Dr. Barns, in 2,416 deliveries, used the forceps only six times, or once in 401 cases. Dr. Davis, in 7,371 deliveries, employed them six times, or once in 1,220 cases. Dr. Collins, at the Dublin Lying-in Hospital, attended 16,414 deliveries, and employed the forceps only 24 times, or once in 618 deliveries.

These statistics from the practice of great men of vast experience should prove to us how seldom it is necessary to resort to instruments in the practice of obstetrics; and I am satisfied that the private practice of most of the obstetricians of the United States and Great Britain, if not of the continent of Europe, will substantiate this opinion.

No judicious practitioner will hesitate one minute to use forceps where he feels that necessity demands their use. We are bound to assist nature where the indications are that she cannot complete the labour safely unassisted; and whenever the forceps will answer our purpose, we must use them without hesitation or postponement, lest the resources of life become so exhausted that the mother, child, or both, succumb after delivery has been accomplished.

Dr. Churchill says that in simply tedious labours no mothers die. I will ask, Why, then, interfere with nature's efforts before labour has fairly begun? And why disregard the teachings of mature and enlightened experience, and the honest advice of the sages who taught us almost all we know that is useful and practical in midwifery?

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OBSERVATIONS ON DISLOCATIONS OF THE HIP.

By U. C. Lynde, M.D., of Erie County.

[Read by title.]

The writer does not intend this paper as a compilation in any sense of the word, nor as an essay, but simply as an offering of a few points of practical importance to surgeons attempting the reduction of dislocations of the femur. Concerning what has been written, he merely wishes to state that no surgeon can afford to be wanting in his knowledge of the parts played by the ilio-femoral ligament, the obturator internus muscle, the capsular ligament, and the rim of the acetabulum, either in determining the character of the dislocation, or in aiding or obstructing its reduction.

With what has been written on this subject he takes it for granted the Fellows are at least as familiar as himself. The importance of these dislocations was forcibly impressed upon the writer's mind when he first began practice, by the failure of three surgeons in the reduction of as many dislocations, in the course of a short time, in the vicinity of his acquaintance. These surgeons failed after other practitioners—not recognised as surgeons, but as experienced men in their profession—had failed. One of these three surgeons mentioned above was and is second to no surgeon in this state, and the other two were surgeons of known ability and teachers in a medical college. In one of these cases the surgeon flattered himself with the idea that he had reduced the dislocation, but that it would not remain reduced in consequence of the rim of the acetabulum having been broken off. In one of the remaining cases the surgeon deceived himself and his patient with the idea that he had reduced the dislocation. In the remaining case the surgeon did not deceive himself or

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his patient, but acknowledged that he had not reduced the dislocation. Why he failed has never come to the writer's knowledge. These patients are yet living, and are more or less crippled.

There are few mistakes the surgeon can make more unfortunate to himself and his patient than that of mistaking an unreduced for a reduced dislocation of the femur, and there are few mistakes of a strictly mechanical nature more common. Strange as it may seem, the writer only knows of five dislocations of the femur outside of his own practice in Erie county, and these are all unreduced, and four of them were believed to have been reduced by the surgeons in charge. Of course, the cases in which the surgeons have been successful have not come to his knowledge. As a majority of these cases occurred in the practice of able and experienced surgeons, and none of them in the practice of the young or inexperienced, there must have been some fault in the methods of diagnosis. What these methods are you all know: measurement, the position of the limb and feet, the ease or reverse of motion, audible snap on the return of the head to the acetabulum, etc.,—all of which, in practice, have frequently misled the best of surgeons.

The writer believes that there is but one conclusive proof of reduction, namely, feeling the head of the femur rotating in the acetabulum. To do this, the surgeon only needs to place his fingers just below Poupart's ligament, one inch outside of the point where the femoral artery crosses the pubic bone. Having placed his fingers on this site, he should bear down with force while an assistant manipulates the limb. The only force justifiable in these cases of dislocation is that used in finding the head of the femur, before, during, and after the reduction. Of course I do not wish to be understood as discouraging what little force a surgeon can exert in the way of traction with his own strength, if he finds it advantageous to use extension. As there is never any deposition of fat in the layers of fascia constituting Poupart's ligament, and as this ligament occupies a site near the head

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of the femur, there is scarcely any more difficulty in feeling the head of the femur in fat people than in lean.

The writer has no more difficulty in feeling the head of his femur rolling in its socket, than he has in feeling the head of his humerus, or the head of his radius, rolling in its socket. He has been called to fifteen cases of dislocation of the femur, and he has found the head of that bone in every case; and in the last cases he has found the head after reduction, and could have found it in all had he sought it.

For the purpose of locating the site of the acetabulum, and keeping this site before his eyes, the surgeon can draw two lines by means of a camel's hair pencil and tincture of iodine, the one running from the anterior superior spinous process of the ilium to the tuberosity of the ischium, the other from the spine of the pubes to the posterior superior spinous process of the ilium: the intersection of these lines will mark the centre of the acetabulum. Now, by drawing a circle about two inches in diameter, with this point as its centre, he will have the bounds of the acetabulum. These lines and this circle will be to the surgeon what buoys are to the pilot.

Another point of importance in the reduction of these dislocations is, that after every unsuccessful effort the surgeon should take new observations, and with the same care as in the beginning, before he had made an effort at reduction. The position of the head may be changed by every unsuccessful effort.

Two surgeons should be engaged in the reduction of a dislocated hip, and three if an anaesthetic be given. The surgeon in charge should observe the locality of the head of the femur, while the other, under his directions, should make the necessary manipulations. Should traction be judged best, it can be used with sufficient force by having the assisting surgeon hold the dislocated limb between his own legs, with his hands in the popliteal space (the leg being flexed, and counter extension being made against the pubes by one foot of the assistant). If necessary, the assistant can be elevated

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by standing on a plank or other body of sufficient thickness. If the pelvis be observed, it will be seen that in most of these dislocations a very little movement of the head of the femur from its abnormal position, if in the right direction, will restore it to its socket.

The hip joint has the deepest socket among all the joints, and is surrounded by the strongest ligaments and muscles; but owing to its being a ball and socket joint with the consequent freedom of motion, and to the small size of the head of the femur, and the great force exerted upon it through the leverage of the shaft, dislocations of this joint are not very uncommon; and for the same reasons there is no other dislocation that the surgeon is called upon to reduce in which he has such manipulative power, nor is there any dislocation more easily reduced when the manipulations are properly executed. Neither is there any other dislocation in the reduction of which care and gentleness are of so much importance. Owing to the great length of the lever formed by the limb, together with its weight, the small size of the head of the femur and its smooth, round surface, the evenness of the osseous surface over which it is to be moved, and the short distance necessary for it to travel to reach the acetabulum, nothing but the greatest care and gentleness should be used in those manipulations for the reduction of hip joint dislocations that have been so well described by Bigelow.

The great danger of failure in the reduction of these dislocations grows out of haste and the use of force. In most of the failures at reduction of hip joint dislocation the head of the femur is left in the ischiatic notch. In attempts to reduce dislocations upon the dorsum by manipulation, the weight of the limb alone is sometimes sufficient to throw the head into the ischiatic notch. This is all the more liable to occur if the surgeon allows the knee to rotate inward. To avoid this result, the limb should be gently sustained, and the knee carefully rotated outward. Though in most failures the head is left in the ischiatic notch, it never remains there, but rises upon the dorsum until restrained by the capsular and ilio-

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femoral ligaments. The writer has taken pains to examine several old cases of unreduced dislocations into the ischiatic notch, and he has found the head in each instance high upon the dorsum.

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ADDRESS ON MEDICINE.

ON THE BACTERIOLOGICAL TEST OF DRINKING-WATER.

By Edward K. Dunham, M. D., of New York County.

Our interest in the bacteriological examination of water rests upon the belief that by its aid we may detect the presence, in a sample of water, of bacteria injurious to health; but still more upon the well founded hope that, through its assistance, we can, or soon shall be able to, estimate the chances that a given water-supply will, in the future, be contaminated with such bacteria.

It is this power of foreseeing danger which gives the test its greatest value, and it is to that power that I wish particularly to direct attention on this occasion. In doing so, it may, I fear, be necessary to consider some of the details of the test more minutely than strictly accords with the general character of an address. But it appears as though the principles involved in the test could not be clearly manifest without some reference to the details of which they are in a great measure generalisations.

In the application of this test the greatest difficulty lies in the proper interpretation of the results obtained by the employment of some of the simplest of bacteriological procedures, namely, the isolation and counting of the living bacteria in a given bulk of the sample submitted to study. And, in practice, we find some diversity in the manner of interpreting results on the part of different observers. Some have contented themselves with a statement of the number of living bacteria found in a standard quantity of water, usually one cubic centimetre, and have condemned those samples which

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contained more than a number previously fixed upon through the examination of waters free from suspicion of injurious contamination.

Other observers have depended for their judgment upon the detection of species of bacteria of recognised pathogenetic character, considering, with justice, the presence of even relatively large numbers of non-pathogenetic bacteria as in itself a practically harmless circumstance.

The criticism to which the first of these two methods is open is, that it is too sweeping in its condemnation of those waters which contain more than a very few bacteria. For the numerical standard of good water must be set at a low figure in order to exclude some waters which are open to question; whereas, undoubtedly, many waters containing large numbers of bacteria are above suspicion.

The second method is open to the serious objection, that, in order to give a decisive opinion, it depends upon the finding of species of bacteria which may be present in but small numbers, and which are then very difficult of identification in the presence of a number of other species. Therefore, although its verdict is conclusive when positive, its results can be of no value when negative; and, moreover, a negative result can throw no light upon the chances of a future contamination of the water-supply with injurious bacteria.

There is a third method of interpretation which has a much higher aim than either of the two already mentioned, and which is capable of becoming more exact in proportion to the advances made in our knowledge of the part bacteria play in nature. This method endeavours to trace the past history of a water by means of a study of the bacteria it contains, in order to estimate the dangers of injurious contamination to which it has been exposed, and the extent to which natural processes of purification have been active in reducing those dangers.

In its application it involves the determination of the species of bacteria in the water, together with at least an approximate estimation of the number of individuals belonging

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to each one of those species present in a given bulk of the water.

Before proceeding to a more detailed consideration of this method of interpretation, it appears desirable to give an outline of the technical steps taken in counting, isolating, and identifying the bacteria in water.

After the collection of the sample in sterile vessels, in such a way as to avoid its contamination with foreign bacteria, the first step in its examination is the preparation of "plate" or "roll-tube" cultures, which have for their object the separation, from each other, of the individual bacteria in the sample. This object is gained through the use of culture media, which may, at will, be rendered either liquid or solid, without thereby endangering the vitality of bacteria scattered through them. The medium commonly used for this purpose is a jelly of considerable firmness, which has been rendered highly nutritious by the addition of meat extracts and peptone, and then rendered sterile by killing any contained germs with heat.

Definite quantities of the water are thoroughly mixed with several times their bulk of this jelly in a melted state, and the mixture then poured upon a cold, sterile, horizontal glass plate, where it quickly solidifies in a uniform layer, forming a "plate" culture; or the mixture is solidified in a thin, uniform layer upon the inner surface of a test-tube, by rotating the latter around its axis, held in a horizontal position, until the jelly has cooled. This, the "roll-tube," is a modification of, and serves the same purpose as, the "plate" culture.

By this mixing of the sample of water with melted jelly, the bacteria contained in the former are separated and disseminated through the mixture, so that, when the latter becomes solid, each individual bacterium occupies a fixed, isolated position in the layer of solid jelly. If now these plates (or tubes) be set aside, under favourable conditions and protected from the intrusion of foreign bacteria, the bacteria contained in the jelly will multiply so rapidly that in the

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course of a few hours many thousand bacteria will have sprung from each bacterium originally imprisoned in the jelly.[1] But inasmuch as the descendants of each individual are confined, by the solid jelly, to the spot originally occupied by their progenitor,[2] it follows that in the course of time an accumulation of bacteria large enough to form a mass visible through the microscope, and later to the unaided eye, takes place at that spot. Such an accumulation is a "colony" of bacteria, and since it must necessarily be made up of individuals belonging to a single species,[3] it is a "pure culture," and serves as the starting-point of other pure cultures of the species in jelly or other media.

Fortunately, colonies of different species differ more or less in appearance as they develop in the layer of jelly, and in some cases species may be identified with considerable certainty by the gross or microscopic appearances of their colonies on the plate; but in most cases this is impossible, and the bacteria making up a colony must be submitted to further observation before it is possible to completely identify the species to which they belong.

After noting the facts which can be gleaned from an examination of the colony, small portions are removed by means of a sterile needle and planted in other culture media, where the growth of the species, as affected by differences in nourishment, temperature, and other conditions, may be observed. The colony on the plate also yields material for the preparation of stained or unstained specimens for the direct observation of the individual bacteria through the microscope, thus furnishing data as to their shape, size, mode of aggregation, and powers of locomotion.

By procuring a sufficient variety of conditions under which the growth of a given species of bacterium is studied, it is

[1] There are species of bacteria incapable of growing in gelatine at ordinary temperatures. The presence of these species is ignored where gelatine plate-cultures are used for water analysis.

[2] There are exceptional species which swarm over the plate, so that distinctly isolated colonies are not formed.

[3] The certainty of this purity is proportional to the thoroughness with which the water was mixed with the melted jelly.

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possible to obtain enough data as to its characteristics to distinguish that species from all others. When this has been accomplished, the given species has been identified.

The media in general use for these purposes are jelly, bouillon, agar-agar, potato, bread, and coagulated blood serum. All these media, except jelly, can be used for the cultivation of bacteria at the temperature of the body, without altering their physical condition, so that the modifications in the growth of the bacteria due to differences in temperature can be observed.

A question of a good deal of interest here confronts us,—the question as to the proper conception of a species among the bacteria. Cultures of the same species may show considerable variations in their characters when subjected to different environments—variations so wide that they exceed what are in other cases regarded as specific differences. This question is too involved and technical for discussion on this occasion. For the purposes of the bacteriological test of water, the practical course is to regard any marked characteristic as specific. The object of the test being to enable us to judge of the past history of a water by means of the evidence furnished by the bacteria it contains, the particular conditions under which those bacteria have developed are a part of the knowledge we are seeking; and if variations in those conditions are recorded in corresponding modifications in the characters of the bacteria, those modifications may be as important to us as a real difference of species, and we may therefore, provisionally, regard them as specific.

We have now rehearsed minutely enough, for our present purpose, the technical procedures involved in a bacteriological examination of water, and may now turn our attention to the nature and significance of the results obtained by their application.

If we trace the history of a given sample of water, we shall arrive at a point in that history when the water must have fallen as rain. Since water, when it evaporates, leaves behind it all suspended matter, it follows that any bacteria

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found in rain-water must have been washed from the air, or from the surfaces with which the rain came in contact. They were either in the atmospheric dust, made up of fine, dry particles wafted into the air by currents, or they were upon the water-shed.

It so happens that bacteria are not all equally capable of preserving their vitality when subjected to the desiccation which must precede their presence in floating dust, and it follows therefrom that rain-water, except under extraordinary circumstances, will contain only species included in a group provisionally designated as "air bacteria," without implying that they are found only in the air. And, conversely, if all the bacteria in a sample of water are of species included in this group, the deduction that it has been exposed to none but aërial contamination appears reasonable, no matter how numerous the individual bacteria may be.

If we next imagine that the rain-water has fallen upon the ground and thence washed into streams, ponds, or open wells, it is evident that it will carry with it those bacteria which can be readily detached from the vegetation or the soil over which it has passed. In brook- or pond-water we may, therefore, look for not only air bacteria, but bacteria belonging to a second group of species representative of surface drainage.

While a portion of the rain-water runs from the surface, another portion sinks into the ground and eventually becomes blended with what is called the "ground-water." During its passage through the soil, most, and probably in many cases all, of the bacteria contained in it are caught in the interstices of the ground, or are subjected to unfavourable conditions and die. Observation has shown that ground-water is usually free of bacteria, or contains them in but small numbers; but when the soil is very pervious the ground-water may yield bacteriological results approximating those indicative of surface drainage.

The ground-water underlies a layer of soil rich in bacteria, and is exposed to many chances of receiving them on its passage toward the surface, where alone it can be of domestic

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use. And it is during this passage to the surface that it is exposed to the greatest risks of contamination with sewage or excrementitious matter, which are especially liable to contain noxious bacteria.

In such a water the bacteriological test is capable of detecting the contamination, and of determining its nature with considerable precision.

From a bacteriological point of view, admixture of sewage with a water can be injurious only when that sewage contains noxious bacteria. If, through any process, the sewage be freed of such bacteria, it will be deprived of all bacteric infectious qualities. The most common natural process by which sewage is freed of bacteria is filtration through the soil. If all the bacteria are removed, the sewage can contain no pathogenetic species, but if they are not all removed, and the sewage passes into a water-supply, the latter will be in danger of infectious contamination so soon as the sewage contains pathogenetic bacteria.

The detection of the contamination of a water-supply with sewage is of particular interest, because of its relations to the possibility of infection with typhoid fever following the drinking of such a contaminated water.

We know of no general natural habitat of the typhoid bacillus. It may be that, in the future, some natural home, or mode of development, of that bacterium will be discovered. When that knowledge has been acquired, the bacteriological test of water can be so applied as to make practical use of it, but for the present we must consider the discharges from individuals suffering from typhoid fever as the source from which typhoid bacilli might gain access to drinking-water.

If the water were free of bacteria before the entrance of the typhoid bacilli, and the latter were not mixed with other species of bacteria, their detection would be simple and certain, and with the finding of them a bacteriological examination of the water would come to an immediate conclusion. But in actual cases the typhoid bacilli are associated with large numbers of faecal bacteria, and this mixture dissemi-

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nated through a large bulk of sewage: the chances of identifying the typhoid bacillus are inestimably diminished by these circumstances, and we are therefore constrained to condemn water containing faecal bacteria, or those forms of putrefactive bacteria which are frequently found in sewage, even though they themselves may have no pathogenetic qualities, and even though the source of the water be apparently pure.

Simple and clear as are the principles underlying the bacteriological test of water, it does not seem superfluous to consider a few typical illustrations of their application to cases met with in actual practice.

I. A sample of water was found to contain an average of 496 bacteria in one cubic centimetre, a very large majority of which belonged to a single species, micrococcus candicans—a very common air bacterium. There were but few other species present, most of which were recognised as common air species.[1]

The inference from such a result is direct: The water, a pure water, had been exposed to the air, and then remained subject to conditions favourable for the development of the bacteria which had fallen into it until they had increased to the number found. This conclusion was confirmed by the fact that the sample, as was afterward learned, had come from a tank which was filled with water previously subjected to a very intelligent process of filtration. Some of this same water, after being bottled for a short time, contained 3,970 bacteria per cubic centimetre, among which five species were recognised, the majority of the individuals belonging to the single species candicans.

No reasonable sanitary objection could be raised against this water, either before or after it had been bottled, although the number of bacteria found in both samples exceeded the usually accepted limit for good water.

Many of the air bacteria seem, after a time, to die out when introduced into water, as is exemplified by a sample of

[1] Bacillus luteus, yellow sarcina, micrococcus cereus flavus, and some not named.

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rain-water, which, immediately after collection, during a gusty thunder-storm, contained 5,940 bacteria, while, after standing protected from dust for a few weeks, the number had fallen to two. On the first examination there was a large number of species present; on the second examination only a single species, common in both air and water.

II. Water from a sylvan brook, swollen after a heavy rainfall, contained over two thousand bacteria to the cubic centimetre, a large number of which proved to be bacillus subtilis, a species found in abundance on vegetation and in earth. There was also present a species frequently found in soil. No other species other than air species were found, and it was therefore concluded that the large number of bacteria was due to surface drainage innocent of injurious qualities.

III. A brook was examined at its source, where the water ran from a loosely covered cleft between two rocks; again about half a mile from its source, after it had wound through a grove and open fields; and again at a third point, about three quarters of a mile beyond the second place of collection, and several hundred feet below a point where it received the drainage from some half dozen dwellings.

At its source it contained 250 bacteria, among which there were several air species, a few of the more common water bacteria, also occasionally met with in air, and a few earth species.

Samples from the second point of collection contained 532 bacteria, similar in character to those at the source, but the water and soil species were relatively more abundant.

At the third point of collection the number of bacteria had risen to 4,773, and, besides the species found above, there were both faecal and putrefactive species present.

The correspondence between the results of the bacteriological examination of this brook and the history of the water is so close, that, if we knew only those results and the order in which the samples came, we should be obliged to construct a history of the water essentially identical with that of this brook.

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IV. The water-supply of a certain town is drawn from a series of driven wells, which are, with the single exception of one used for making observations on the level of the ground-water, connected in such a way that the water is pumped from them all collectively.

A sample of water taken from the main at the pumping-station contained two bacteria per cubic centimetre, while a sample taken from the observation-well contained five thousand. But the bacteria in the latter sample were all of one species, namely, the same species which has already been mentioned as persisting in a long preserved sample of rain-water. According to our principles of interpretation, these samples must be regarded as equally free from suspicious contamination. The five thousand bacteria were due to an adventitious inoculation of the test-well with a harmless species capable of thriving under the conditions there prevailing. After stating that the bacteria present were of a single species, it is superfluous to add that the well was kept covered.

V. A deep artesian well, situated in the immediate neighbourhood of a field irrigated with the sewage from a large public institution, was used as the water-supply for the inmates. The water had been repeatedly declared unsafe because of the high yield in total solids, chlorine, and ammonias obtained on chemical analysis. It was examined bacteriologically, and found to contain very few bacteria, none of which represented species indicative of sewage contamination. There were no clinical indications that the water was unwholesome. In this case, it appears that the natural filtration of the water through the soil sufficed to free it of bacteria.

VI. A stream which was drawn upon to furnish water to a town was suspected of being contaminated with sewage, because of an outbreak of typhoid fever in that town. Chemical analysis failed to furnish evidence of any such contamination, but the water was found to contain large numbers of bacteria belonging to a putrefactive species common in sewage. This result, while not demonstrating the presence

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of typhoid germs in the water, arouses a strong suspicion of a sewage and faecal contamination, which alone would be sufficient to declare the water untrustworthy.

In conclusion, it is evident that the bacteriological examination of a water cannot, save under exceptional circumstances, pronounce a direct verdict as to the sanitary value of that water. Its legitimate province is the discovery of the relations existing between the water and the natural or fortuitous distribution of the various species of bacteria. The significance of those relations must be determined by our knowledge of the causation of disease.

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THE CURE OF HAEMORRHOIDS BY EXCISION AND CLOSURE WITH THE BURIED ANIMAL SUTURE.

By Henry O. Marcy, M. D., of Boston.

The recent discussion upon the surgical treatment of haemorrhoids, published in the "New York Medical Journal," evoked by a late paper of Mr. Whitehead's, of Manchester, England, is both timely and interesting.

The modifications of wound treatment, based upon aseptic measures, mark the present as an era of surgical revolution, to which the surgery of the rectum should be no exception.

Few of the minor surgical diseases cause so much suffering and give to the general practitioner such constant repetition of complaint as those of the rectum; and in return for service rendered, no class of patients is more appreciative and grateful.

The teachings of the text-books, with few exceptions, offer very little improvement upon the methods of the fathers in the treatment of the diseases of the rectum. The advocates of the ligature, perhaps, equal those who claim superior advantage to be derived from the use of the clamp and the cautery. Although a permanent cure is often obtained from the use of either, I am constrained, myself, to believe that both are radically defective, and should be relegated to history.

While it may be conceded that the general practitioner is, in large measure, familiar with the pathological conditions pertaining to haemorrhoidal disease, nevertheless it is well to keep ever in mind that the blood is carried with the arterial impulse directly to the part, through short branching vessels, and that the capillaries empty into an extraordinary net-work of veins, whence the blood passes through the inferior mesenteric into the portal system. These veins are entirely with-

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out valves. Boerhaave and Morgagni pointed out these anatomical peculiarities, and, reflecting upon the horizontal position in the lower animals, thereby taking off the superincumbent weight of the blood column, deduced it as a reason why quadrupeds are not subject to haemorrhoidal disease.

I take pleasure in calling attention to a recent most interesting and learned article upon this subject by Dr. Bodenhamer.[1] It seems, however, a just criticism that the weight of the venous column alone acts only in a very subordinate degree as a predisposing cause, although manifestly an important factor after the blood current becomes greatly retarded in the oftentimes enormously dilated haemorrhoidal veins. Were the cause to be found in this peculiar distribution of the portal circulation, the upright position of man would make this condition the rule rather than the exception; and it would be indeed extraordinary to find the varicosites limited to the haemorrhoidal plexus, and lying almost entirely external to the sphincter muscle. Oftentimes, however, after the pathological condition has become well established, the current through the ectasic vessels is so greatly retarded by the weight of the blood column, in the erect position, that most invalids learn to seek relief by change of posture. Anatomists emphasise, in the normal condition, the large number of haemorrhoidal veins and their comparatively large size. In relation to the surrounding pelvic organs, they occupy a dependent position, and their only support is derived from a loose net-work of connective tissue. It is apparent that the anatomy of these thin-walled vessels, their relation to the surrounding parts, and their physiological function, furnish, as it were, a predisposing cause of disease. To this, very probably, may be added individual structural weakness, as is so often seen in persons with thin-walled veins of the lower extremities. It has long been recognised that the varicosites of the haemorrhoidal vessels, which are probably wanting in the lower animals, are comparatively rare in the

[1] Are Quadrupeds Subject to Haemorrhoidal Disease? William Bodenhamer, M. D. New York Med. Jour., page 39, January 12, 1889.

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savage races, and become, in a considerable ratio, a more and more constant factor in the sedentary occupations pertaining to modern civilisation. A great variety of pelvic diseases in the female, the genito-urinary diseases in the male, complicated with constipation, are in a large measure active causes of rectal disease.

The rectum may be considered as a convenient cesspool for the reception of the waste and worn-out *débris* of the alimentary canal, which is ever poured into it in a more or less fluid state. The curves of the lower bowel, from the sigmoid flexure downward, are an evident design, in part at least, to vary the support of the weight of the column, and are admirably adapted to deflect and equalise the pressure. As a still further aid, that portion grasped by the sphincter ani is firmly held in the levator loop, and by it carried upward and forward, thus taking the weight of the mass, in large measure, off from the anal outlet.

When the rectal contents remain sufficiently soft to produce everywhere equable pressure, the circulation is comparatively little disturbed, and defecation is accomplished with very little muscular strain. Let, however, retention of the contents, with absorption of the fluid portion, go on until the moulding process becomes one of difficulty, and the reverse is true. The overloaded rectum produces pressure upon the venous return current, reflexive nervous irritation supervenes, a hyperaesthetic state follows with increased tension of the sphincter ani. Pari-passu a cellular infiltration goes on in the loose connective tissue of the parts, as the result of the venous congestion, and the irritated nerves continually repeat the telegraphic messages of pain and suffering.

Although the pathological conditions above described produce by far the larger part of suffering ascribed to so called "piles," we must not forget that there are other diseased conditions which may be confounded with the above. Small, fleshy masses about the verge of the anus, sometimes called condylomata, are of easy distinction. They have nothing whatever to do with the haemorrhoidal veins, and are changes

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in the connective tissue of the deep layers of the skin, or mucous membrane, and may be the result of friction, or erosion, arising from a variety of causes.

The so called villous tumor of the rectum is of sufficient frequency to be held in consideration. It is not unlike the villous growths of the bladder and other mucous surfaces. Its extraordinary vascularity commonly reveals its presence, because of haemorrhage; and unless differentiated, it will be diagnosticated as a bleeding pile. The soft, mucous polyp of the rectum is an adenomatous structure of close relationship to the villous growth, and is sufficiently often the cause of suffering to be kept in mind.

Mr. Whitehead, of Manchester, already referred to, emphasises the pathological conditions described above very properly, and insists upon it that the extraordinary dilatation which the veins often undergo can be learned only by the dissection of the living subject. My own attention was called to this condition many years ago in finding how very commonly veins of the rectum were enormously dilated in the female who had suffered laceration of the perinaeum. However, where the laceration is complete, the ectasic vessels are wanting, although the mucous membrane of the rectum, under these conditions, is often seen as a soft, projecting, reddish tumor. From this it would seem safe to infer that the sphincter constriction, with the changes incident upon the retention of the rectal contents, acts as the cause of the dilatation of the vessels, rather than the superincumbent weight of the portal column of blood.

When the venous plexus of haemorrhoidal vessels has become pronouncedly varicosed, they have, as a covering, the lax sub-mucous tissue of the rectum close to the anus, and when put on tension are protruded as a ring of transverse rugae round the anal aperture. Certain of the rugae are developed into rounded protuberances, and sometimes even into fungoid tumors of considerable size. Blood stasis often occurs, producing induration; and suppuration may supervene.

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The veins sometimes rupture into the connective tissue, and changes follow which result in tumors of various size, color, and density,—so called external piles. The straining in defecation, or the gentle pressure of the finger from above downward, will frequently cause soft, bluish, exquisitely sensitive, grape-like masses to protrude,—internal piles. The mucous membrane covering these is frequently congested and abraded so that a more or less continuous haemorrhage ensues.

The method for the cure of haemorrhoids by the use of the ligature, applied with slight modifications of detail, has been considered the safest, surest, and most manageable procedure. The projecting tumors, having been well drawn down, are usually transfixed with a curved needle, armed with a double ligature, tied firmly in halves, and a portion of the strangulated mass excised. In this way all the haemorrhoidal tumors are tied, and the mass is returned within the sphincter. This was the favourite operation of the late Dr. Van Buren, of New York, and his followers; and has at present, in Mr. Allingham, the famous English surgeon, its most distinguished advocate. The use of the ligature, applied to cause necrosis of tissue, and then allowed to remain in the wound, is open to the same general objections which have caused its abandonment, applied in this manner to the constriction of the large vessels. Sloughing necessarily supervenes, which means always an infected wound, and exposes the patient to the same dangers, although perhaps less in degree, as infection in any other part of the body.

That this is not hypothetical criticism there is abundant proof. The stoutest advocates of the ligature admit that abscesses, general septic poisoning, and other dangers, as secondary haemorrhages, are not wanting in the experiences of the most careful and practised surgeons. Were it necessary to adduce proof of the above statements, quotations could easily be given. Although these dangers are exceptional, making the operation a comparatively safe one, I cannot doubt but that the experience of many whom I am addressing could

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be added in corroboration of my personal testimony. Growing out of the dissatisfaction resulting from such experiences, the use of the clamp and cautery came into vogue, and has been especially popularised by the distinguished surgeon, Mr. Henry Smith, of London.

This procedure I early adopted in my own work, and enthusiastically advocated its use for years. Its advantage over the ligature lies chiefly in that the primary wound is aseptic, while, by the time the slough is ready for separation, the subjacent tissues are fairly well protected by an abundant proliferation of granulating tissue. In my own experience, the suffering caused by the burning, which is especially painful if any of the external tissues are involved, is decidedly objectionable; while all wounds produced upon any of the tissues of the body by the cautery are invariably slow of repair. I am of the opinion that the results which I have obtained after the use of the cautery have been generally more satisfactory than with the ligature. Haemorrhages are reported to have occurred secondarily, and it is claimed that contraction is much more common than after the use of the ligature. It may be accepted that the use of the cautery, except perhaps in certain conditions in uterine cancer, has been very generally relegated to the past. Even in cancer of the uterus it finds fewer advocates than formerly. Certainly bleeding can be controlled without its use, and it is doubtful if *deep* burning be safer than the *deep* cutting of any tissue.

Various crushing instruments have been devised, to be used either with or without the ligature, for the purpose of producing more rapid necrosis of the tissue involved. The advantage claimed for the operation of crushing is the avoidance of haemorrhage; but, on the other hand, some operators report that haemorrhage has followed its use. Theoretically, crushing seems to me to offer very doubtful, if any, advantage over the use of the ligature; and, like the latter, it must make a septic wound. Therefore I discarded it without trial.

There remains to be considered the cure of haemorrhoids

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by the chemical action of certain medicamenta injected into the parts. Few of the modern methods of surgical procedure met the enthusiastic trial and received more speedy adoption than this, the so called carbolic-acid treatment of piles. It had much to warrant its acceptance. Carbolic acid of itself was then believed to be the chief of antiseptics, rapidly coagulating the blood and the albuminoids. There was little danger of poisoning from its absorption. Variously combined with morphia, cocaine, etc., little pain followed its use. Patient and physician were alike enthusiastic.

At present it appears, however, that the general consensus of surgical opinion is, that the result is, in large degree, disappointing. When the stronger preparations are used, causing necrosis of tissue, no matter how carefully injected, not seldom the tissues desirable to be removed fail to be acted upon, while those that should be retained are destroyed by the sloughing. The explanation is, that the fluid introduced into the loose-meshed connective tissue escapes beyond the extraneous part. When weaker preparations are used, even after many repetitions of the injections, the haemorrhoidal vessels remain comparatively little changed. The method of cure by injection is also sometimes objectionable and even dangerous from secondary results. It is only recently that I have seen a young and otherwise healthy man rendered seriously ill with high fever and general septic poisoning, supervening upon the injection of haemorrhoids at the hands of one of our most distinguished experts, where the connective tissue surrounding the anus remained for some days aedematous, reddened, and painful.

After this somewhat hasty, but, I trust, judicial and dispassionate criticism of the above methods, it may be asked if any better method can be offered for the cure of haemorrhoids.

There remains for us the discussion of Mr. Whitehead's operation for cure by excision. This I do not hesitate to accept as a distinct step in advance of the surgical procedures previously discussed. We have seen that the vessels are frequently so deformed as to fail entirely in the original

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purpose for which they were designed, and the end sought to be attained by all the previous methods is their destruction and removal. The real objection to dissection has been the fear of haemorrhage; and as a means to obviate this, both the ligature and clamp and cautery were devised.

Mr. Whitehead has already shown us that his method of dissection is safe, that the haemorrhage is not excessive, and that a rapid cure results. It is certainly scientific, in that by a clean dissection, the parts desirable to eliminate are removed. The free edges of the divided tissues are stitched together, followed usually by primary union. Mr. Whitehead's method is best given in his own words: "By the use of scissors and directing forceps, the mucous membrane is divided at its junction with the skin round the entire circumference of the bowel, every irregularity of the skin being carefully followed. The external and the commencement of the internal sphincters are then exposed by a rapid dissection, and the mucous membrane and attached haemorrhoids, thus separated from the sub-mucous bed on which they rested, are pulled bodily down, any undivided points being snipped across, and the haemorrhoids brought below the margin of the skin. The mucous membrane above the haemorrhoids is now divided transversely in successive stages, and the free margin of the severed membrane above is attached, as soon as divided, to the free margin of the skin below by a suitable number of sutures. The complete ring of pile-bearing mucous membrane is thus removed."

Mr. Whitehead very wisely emphasises thoroughly paralysing the sphincter by digital stretching. The bleeding vessels, which are small and easily seized, are immediately twisted upon division. The sutures are interrupted, and are of carbolised silk.

The criticisms that followed the presentation of Mr. Whitehead's paper,[1] read at the meeting of the British Medical Association in 1886, were for the most part favourable. Dr.

[1] "Three Hundred Consecutive Cases of Haemorrhoids Cured by Excision," by Walter Whitehead, F. R. C. S. E., England. British Medical Journal, February 26, 1887, p. 449.

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Cousens emphasised the importance of the ring of ligatures, which he so carefully applied around the anus, as the real protection against haemorrhage.

Dr. Kelsey, of New York,[1] however, criticises Mr. Whitehead's method as "a naturally difficult, tedious, and bloody operation," and that no essential change has been made in the guiding principle. He claims that Mr. Whitehead does not give results in sufficient detail to enable us to judge of the points necessary for decision. Dr. Kelsey reports, with much greater approval, the experience of Dr. Weir in six cases of Mr. Whitehead's operation. He admits that Weir's experience shows results better than those obtained from the use of the ligature; but Dr. Kelsey, who seems never to have done Whitehead's operation, expresses a distinctive preference for the clamp and cautery.

To these criticisms Mr. Whitehead[2] makes emphatic answer, first, "that young surgeons have repeatedly assured him that they do not find the operation difficult, and he is satisfied it is an operation which can easily be performed by any surgeon possessing average skill and intelligence;" second, "that in an average case it can be completed in ten minutes;" third, "that the haemorrhage is never excessive: such as I meet with may very well take a subordinate position to other and more important considerations involved in the operation."

Mr. Whitehead's experience at the time of reading his paper included three hundred cases of operation,—certainly sufficiently ample upon which to base deductions, and which entitle his opinions to the highest consideration and respect. He clearly demonstrates that hitherto the profession have far too greatly feared the dangers from haemorrhage, seemingly the sole cause of objection to the dissection method.

It does not seem hypercritical to take exception to Mr. Whitehead's definition of the diseased condition as "a pile-bearing membrane," which he emphasises should be removed.

[1] New York Medical Journal; December 8, 1888, p. 626.

[2] "The Operative Treatment of Haemorrhoids," by Walter Whitehead, F. R. C. S. New York Medical Journal, February 23, 1889, p. 207.

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The deformed ectasic haemorrhoidal plexus is the important pathological factor, and the other changes which ensue are entirely secondary and comparatively unimportant. After the operation, the collateral circulation is speedily restored. The criticism that the minute venous radicles may be considered as rudimentary piles, although in a sense a quotation, is scarcely just to the author, who plainly considers them as a part of the dilated plexus of vessels already existing, only subordinated by the larger growths. These left behind, all know, are often a source of trouble. The conditions which pertained at the beginning as the active cause of the disease may again reproduce disease, but certainly rarely to the extent of forming haemorrhoidal tumors.

About ten years ago I operated upon two cases of prolapse of the rectum, by first, before resection, entirely encircling the prolapsed part with a row of continuous double tendon sutures. From the excellent result following these operations I was led to apply the same method to the base of the ring of the dilated haemorrhoidal vessels before resection. For some years this manner of suturing has entirely superseded all others in my practice, and has been repeatedly demonstrated to members of the profession, with their distinct approval. The results of my experience in the use of the buried suture in the treatment of haemorrhoids I incorporated in a paper read before the American Medical Association, which was published in July, 1888.[1]

On account of its simplicity, safety, and exceptional result, after abundant experience, I do not hesitate to offer it to the profession as possessing distinct advantages in the treatment of this troublesome affection. Care must be taken previous to the operation to have the large intestine thoroughly emptied, usually by an active cathartic, supplemented by a large injection given a few hours before operation.

The patient is etherised, placed in the lithotomy position, the limbs supported by the Clover crutch or some modifica-

[1] "The Surgical Advantages of the Buried Animal Suture." Journal of the American Medical Association, xi, p. 78.

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tion of it. The parts are thoroughly cleansed by a sublimate solution, as in other operations. The digital dilatation of the sphincter is carefully made until the muscle is paralysed. The rectum is then washed with sublimate solution, care being taken that none of it is allowed to remain. A considerable pledget of wool, into which iodoform has been freely dusted, is placed in the rectum. All the subsequent stages of the operation are carried on under irrigation with sublimate solution. Along the line of the juncture of the mucous membrane with the skin, either with a sharp knife or scissors, division is made from the central line posteriorly from below upwards on both sides to the median line above. With a little care this division is made without injury to the plexus of vessels. The loose connective tissue fascia is easily separated by the finger, or a blunt instrument, quite deeply, cutting any connective tissue bands which may appear. The mucous membrane above the plexus is divided transversely in a somewhat similar manner. The deformed haemorrhoidal plexus is thus separated from its surroundings except at its base. A needle, with eye near the point, threaded with tendon, is carried posteriorly behind the mass, unthreaded, rethreaded with the opposite end, and withdrawn, the stitch resembling that taken by the shoemaker, drawing the waxed ends of his thread in opposite directions through the hole he makes with the awl.

In this way the entire base is encircled by a line of deep, double, continuous sutures. As will be observed, this is the stitch I have for many years used in the coaptation of deep parts by the buried suture, as, for example, in operation for hernia, in the repair of the perinaeum, and in constricting pedicles of abdominal tumors, &c.

The advantage derived from this manner of sewing is, that even, continuous compression is secured, from which it is impossible for any tissue to escape. The stitches are not drawn too closely, since they are used to protect against haemorrhage, and not to produce necrosis of the enclosed parts. With scissors dissect away the haemorrhoidal plexus just

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above the line of suture. The mucous membrane is now stitched by a continuous tendon suture to the line of division first made through the skin. This may be done either with the over-and-over stitch, or that which I have more recently learned to prefer, a running "blind" stitch taken from side to side from within outwards, which also buries the external line of sutures. In this way it will be observed that no stitches are left in sight; that the divided edges are evenly and accurately approximated, restoring the parts to their normal condition.

The wound is then carefully dried, dusted with iodoform, and often still further protected by a thin layer of iodoform collodion.

If properly done the operation is aseptic, and is followed by primary union. Were it requisite I could give a long series of cases with detailed results; also a series of photographs showing the different stages of the operation and the processes of repair at different dates. All this, however, seems superfluous. Almost without exception the patient is remarkably free from pain, and the processes of repair go on rapidly. When the operation is uncomplicated by any other done at the same sitting, absolute restraint in bed is not necessary, and micturition is usually voluntary and easy. Only one case has proved an exception, and that, unfortunately, a distinguished member of our own profession. In this instance I departed from the rule which I believe should be absolute, and left a small portion of the plexus, in front, undissected, because it was comparatively little changed. Elsewhere the ectasia was enormous. The healing of the wound was rapid and satisfactory. The anterior portion not included became aedematous, exquisitely sensitive like an acutely swollen pile, caused reflexive vesical tenesmus, retention of urine, prolonged catheterisation and cystitis. This remaining portion had ultimately to be removed, and the urinary conditions long remained troublesome. The cure of the haemorrhoids is, however, complete, and all the old sufferings have disappeared.

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The case is instructive as well as interesting, enforcing a surgical rule which the anatomy of the part should teach, and which Mr. Whitehead very properly emphasises,—the careful removal of the whole haemorrhoidal plexus. By whatever method attempted, it is the failure to do this which gives failure in result. I do not remember ever to have dissected the parts, however seemingly irregular was the distension of the veins, without finding the whole plexus varicosed. The circulation through the veins, when once changed to cause dilatation, almost necessarily involves the whole plexus.

Emphasis should be made in clinical instruction upon the early voluntary evacuation of the bladder in the position easiest to accomplish it. The bowel may be safely moved the third or fourth day. Prolonged constipation, resulting in hardened faeces, is to be avoided.

In summarising, I think I may safely conclude,—First, that the ligation of tissues, for the purpose of producing necrosis and the resultant septic decomposition, should to-day be considered as unsurgical and unscientific, and should never be resorted to in any part of the body.

Second, the destruction of tissue by the actual cautery is productive of pain and suffering, and is unwarranted because unnecessary, with the rarest of exceptions; that the arguments in defence of its use in haemorrhoids would equally well apply to many other operations where it has been universally abandoned; that it is a relic of the barbarism of the past, and should be relegated to history.

Third, the dissection and the removal of the haemorrhoidal plexus of diseased vessels are as rational and as scientific as the dissection and removal of diseased tissues elsewhere. The danger of haemorrhage from the excision of these structures has been greatly exaggerated. Mr. Whitehead has shown in his abundant experience that they may be freely dissected with safety, without special precaution against bleeding, and that his operation can only in a subordinate degree be called bloody.

Fourth, that by the method which I advocate and prac-

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tise, the operation can in no sense be considered a bloody one. It is simple and easy to do after a little experience. There is no arterial haemorrhage to be controlled. All the important vessels are secured before division by the continuous encircling suture, which serves the still further purpose of coapting and holding at rest the divided connective tissue. Necrosis of the parts is entirely avoided, and with the care practised in modern surgery the wound is maintained aseptic. The superficial tissues are accurately coapted, so that not a single suture acts as foreign material.

The advantages of the buried suture over the excision method, as practised by Mr. Whitehead, I think are,—First, constriction of blood vessels *before* division, which certainly diminishes the loss of blood, and ensures against secondary haemorrhage. Second, a much more accurate and easy mode of readjustment and closure of the parts. Third, continuous animal sutures, which are buried and incorporated into the tissue, have a decided advantage over the interrupted silk suture, which is ever to be considered as foreign, and, if not removed, must be encapsuled or thrown off by suppuration.

The time occupied in the application of the deep and superficial line of continuous sutures is less than is required for a line of interrupted sutures.

The advantages derived from the buried animal suture in other parts of the body are now being recognised as of the first importance. Measures for the permanent cure of hernia are based upon its use. All operative wounds made in healthy tissues, without exception, should be closed layer by layer with the buried animal suture, the skin itself not excepted; and when properly done, drainage is no longer required, and the wound can be at once made germ-proof by hermetically sealing with iodoform collodion. To this rule amputations should prove no exception.

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ATAXIC PARAPLEGIA.

By Darwin Colvin, M. D., of Wayne County.

To criticise the correctness of a statement made by so distinguished an observer as Dr. Gowers, who says that ataxic paraplegia "is a condition comparatively common, but hitherto little noticed in medical literature," would ill become an obscure "country doctor." Still, the confession that I entertain an opposite opinion, since (if I may be allowed the expression) the condition may be more indigenous to Great Britain than to America, does not rise to the level of criticism.

That it may be a condition "comparatively common" where the posterior as well as the lateral columns are involved, I have no doubt, as I believe I have had under observation cases of this character; but to see a case where only the lateral columns are involved has not occurred to me, during a professional experience of forty-five years, before the present year.

It is quite possible, and I am inclined to think quite probable, that many cases of progressive locomotor ataxy have been confounded with ataxic paraplegia, from the fact that some of the characteristic symptoms of the former are not always present in every case; whereas that rule does not hold good in the disease under consideration, judging from the case under treatment and the meagre literature on the subject.

On the 15th of March last, B. McG., a farm hand, Irish by birth, married, and forty-one years of age, called upon me for advice. I obtained the following history at this interview: In January preceding, he first noticed a certain weakness of his legs. He tired more readily than had hitherto been the case. After a time the weakness seemed to develop into an unsteadiness of gait, more especially when occasion required him to be out in the evening. At no time had there been pain, yet occasionally there was some aching in the sacral region.

At the time of his call, the loss of power in his legs was quite distinct,

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so much so that he had recently begun to carry a cane. He could extend the legs with force, but the flexors, of the hips especially, were quite weak. In walking to and from me without a cane, I observed, as his fatigue was increasing, that an increased difficulty in turning was very apparent: in fact, he came near falling, but when given his cane, it was far less. His legs failed him less in walking than when turning. While walking, they were not thrown about; the knee action was not high; neither were the heels first brought to the floor; and his body was not stooping;—yet the legs seemed to be hauled forwards; and as the foot was placed upon the floor there was a decided spasmodic backward action of the knee. The knee jerk, or *patellar reflex, was surprisingly exaggerated,* requiring only a tap of the finger to produce it.

Upon placing him in the recumbent position, I found a well marked rectus, and ankle clonus, also. Sensation was unimpaired.

He informed me that after long intervals he had slight sensations of numbness and tickling, but scarcely sufficient to attract his notice; and he would not have thought of it had I not called his attention to it. At no time has he had a sense of constriction around the waist. Tactile sensibility of the fingers and toes is unimpaired, and there is no incoördination of the fingers and arms, neither has there been any material change in sexual power. The sphincters still retain their normal tonicity, yet occasionally the muscular power of the bladder, or the sphincter, does not readily respond to the will. As yet, however, the bladder does not fail to empty itself. At no time has there been dribbling. There is no muscular atrophy noticeable. I am unable to say whether there is any change going on in the eye.

Upon having him resume the erect posture, with the heels close together and eyes closed, he was noticed to reel, when he would open them for fear of falling. Upon effectually bandaging them, he could touch his forehead with some difficulty; and again would he have fallen had not an assistant placed him upon a sofa. Soon afterwards I found his pulse racing away—one hundred and twenty beats in a minute—not from the previous fear of falling, but from the well marked anaemic condition in which he was at the time. His pulse, ordinarily, ranged at ninety-two; appetite good, yet there was much defective assimilation.

Of the causes of ataxic paraplegia but little need be said, as no one cause has yet been present in the majority of cases; and I am unable to trace the present condition of my patient to any faulty condition in the past or present.

To me the most important point to be considered in investigating a case of the kind under consideration is a correct diagnosis, not, as is usually the case in the majority of dis

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eases, that a correct diagnosis will materially benefit the patient, as far as the treatment of his malady is concerned, but simply to increase our powers of discrimination when carefully studying the various lesions of the spinal cord.

To the inexperienced observer the only disease with which ataxic paraplegia might, in some instances, quite probably be confounded, is locomotor ataxy; and why much care is necessary in distinguishing them is the fact that in some cases of the latter some symptoms, as described by many writers on diseases of the nervous system as attending locomotor ataxy, are not present.

The onset of both ataxic paraplegia and locomotor ataxy, as far as the condition of the lower extremities is concerned, is nearly the same, there being the same paretic condition present.

In ataxic paraplegia the individual has no pain, and there is nothing to be observed in the position of the body proper while walking. He seems to throw his legs and feet forward, placing the foot squarely upon the ground, with no very great observable movements of the knee.

In locomotor ataxy the patient is inclined to stoop, leaning forwards in walking as though looking at the feet; in fact, he does look at them so as, as in some cases which have been under my care, to be certain of their proper implantation, with what might be termed a high knee action, and always bringing the heels to the ground first. I believe Charcot likens it to a high-stepping horse. "The leg and thigh extend quickly and simultaneously, thus producing the heavy fall of the heels to the ground." As a rule, the fugacious pains in locomotor ataxy are almost unbearable. Right here may I be permitted to state, that for many years I had the professional care of a case of locomotor ataxy, the subject of which was a gentleman of culture, and highly connected; and so severe were the fulgurant pains, that, after many years of this atrocious torture, he deliberately took a lethal dose of strychnia. And, notwithstanding the pathetic appeals of relatives and friends, he peremptorily refused medical aid,

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while freely confessing his intentions during the absence of the convulsive seizures, and died in about four hours.

In ataxic paraplegia, the inability to stand with heels close together, and eyes closed, or not being able to readily turn around while walking, is not present in every case; whereas in locomotor ataxy these difficulties are invariably present.

I well remember a case of the latter, occurring in a remarkably well nourished young lady, eighteen years of age, who, if she was assisted to the street, could walk a few rods unaided; but who, in order to return, could not do so unless assisted in the act of turning, yet, with apparently the slightest help she could do so and return to the place of starting.

Another, and, as I believe, pathognomonic, symptom in ataxic paraplegia is the exaggeration of the so called knee and foot phenomena of Westphal, or, as Erb terms them, the patellar-tendon and Achille-tendon reflex. The more common terms used, however, are, I believe, patellar-reflex or knee-jerk, and ankle clonus. I believe it is conceded that the latter movement is only seen when the other myotatic contractions are exaggerated, the more common cause being sclerosis of the lateral columns. These exaggerated phenomena are always absent in a well marked case of locomotor ataxy; yet should they ever be present, they are always feeble—never exaggerated. In the last three cases of the latter disease which I examined, I found them entirely lost in two, and a slight knee-jerk in the third.

The ocular changes before spoken of are said to be rarely present in sclerosis of the lateral columns, but quite commonly so in those of the posterior. However, my lack of education in diseases of that organ prevents me from saying anything in reference to them from clinical experience.

As to the treatment, but little time need be consumed, as I know of no report of a case which has been materially improved, much less cured, under any therapeutic course. The disease progresses at an exceedingly slow pace, only to end in death. However, for a time some medication must be instituted until the victim abandons all hope; and early in its progress,

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notwithstanding the gloomy prognosis of his physician, very naturally he is not without faith that there is a remedy for him. After a time he glides down to the embraces of the charlatan, whose arms are always open, where he mentally revels for a time, and then, in despair, abandons all treatment.

I know of no reason, if cures can be effected in locomotor ataxy (which I very much doubt, yet such cases are reported), why the same or similar treatment should not produce the same result in sclerosis of the lateral columns. It is my belief that if we can benefit a case by any known means, it can best be done by a long continuous course of arsenic. I am sure that I have known some amelioration of symptoms on its use in locomotor ataxy, and for a time in the case now reported. The present case was put upon Donovan's solution in doses of five drops three time a day, and kept under its influence until the following July, when I began the use of arsenic alone, under which I propose to keep him for one year, if I can keep his confidence for that length of time. I should give it in the form of Squibb's solution of arsenite of potassium in doses of five drops three times a day, immediately after meals, increasing the dose one drop daily until decided oedema of the eyelids or gastric irritation became unmistakable. Then suspend the remedy until those constitutional symptoms had disappeared, only to resume and continue it in the same manner until a return of the same symptoms had occurred three times. Then I should resume the dose first given (not to be increased), and continue the same three times a day. Once a month I should suspend the remedy for ten days, and again resume it, alternating the suspension with the resumption for one year at least. After which there would probably be no occasion to administer this or any other remedy to the patient for this specific malady.

I would earnestly urge the Fowler's solution as prepared by Dr. Squibb, as I have found heretofore that much of that drug as obtained at the shops is worthless.

Some flattering reports of the treatment of locomotor ataxy

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by extension have been published by Charcot and others, yet I am quite faithless in the belief that any permanent good will result from that treatment. Still, if such a procedure should prove to be of any value in sclerosis of the posterior columns, as I have before said, I know of no reason why equally good results should not be obtained on extending the treatment to cases of sclerosis of the lateral columns.

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EXTRACTION OF CATARACT WITHOUT IRIDECTOMY: REPORT OF ONE HUNDRED SUCCESSFUL CASES.

By Charles Stedman Bull, M. D., of New York County.

Within the last three or four years the old method of the extraction of cataract without iridectomy, which was formerly devised and practised by the French surgeon David, and called by him "simple extraction," has been revived by Panas, Wecker, and others, and has been in many quarters hailed with all the *éclat* of a new operation. Most of the modern French authors report very enthusiastically in its favour, but none of them have as yet given us any detailed or conclusive statistics in regard to the results obtained, nor any comparative statements as to the advantages of the "simple operation" over those of the so called "linear extraction with iridectomy," devised by Von Graefe, and practised almost universally with great success for the last thirty years. The ideal operation for the extraction of cataract is undoubtedly the removal of the lens in its capsule through a corneal section, and without wound or excision of the iris; and the restoration of sight in this manner, with the preservation of a round and movable pupil, is certainly to be regarded as one of the greatest operative achievements. Sufficient time has now elapsed since the revival of the old "simple operation" to enable us to draw some conclusions as to the merits of this method of operating and the results obtained, in so far as the ultimate vision is concerned, and the writer now presents to the Association, for their consideration, his own experience in one hundred cases of extraction of cataract by the simple method, without iridectomy.

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As a firm believer in the value of antiseptics in ophthalmic surgery, the reporter deems it wise to give in detail all the steps which he considers necessary in the operation, from the preparation of the patient for the operation to the final testing of the vision and the discharge of the case from observation.

If the patient be a hospital case, he should have a bath of the entire body the day before the operation, special attention being paid to the cleansing of the hair and beard with soap and water. This is not considered necessary in the case of a private patient. On the day of operation the patient's face should be carefully washed with soap and water, and just before the operation the face should be laved with Pana's solution of the Biniodide of Mercury, or with a solution of Mercuric Bichloride (1-5000), or with a saturated solution of boric acid, and the latter solution should be used for irrigation of the conjunctival *cul-de-sac*. The patient should be placed in the bed which he is to occupy throughout the entire course of treatment, in order to avoid all unnecessary moving about. This precaution reduces to a minimum the dangers which may arise from prolapsed iris, opening of the wound, loss of vitreous, haemorrhage, etc. After the necessary local anaesthesia has been produced by a few drops of a five per cent. solution of cocaine hydrochlorate, the conjunctival *cul-de-sac* is again thoroughly irrigated with the boric acid solution, and the patient is then ready for the operation.

The instruments must previously have been cleansed and sterilised in boiling water, and placed in a bath of absolute alcohol. From this bath they are taken wet, as they are wanted for the operation. The hands of the operator, and of the assistant, if there be one, must be carefully cleansed with soap and water, and then washed with a solution of corrosive sublimate (1-2000). Some operators prefer Pana's solution for purposes of cleansing and irrigation. This consists of mercuric biniodide .05 grm., alcohol 20 grm., and distilled water 1000 grm.

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The surgeon should sit behind his patient, and should operate on the right eye with the right hand, and on the left eye with the left hand. In this way he is never in his own light. If he is not naturally ambidextrous, he should strive to make himself so. A speculum is then introduced to hold the lids open, and the eyeball is firmly grasped with a pair of fixation forceps, the latter being made to seize the conjunctiva and subconjunctival tissue over the insertion of one of the straight muscles of the eye.

A straight, narrow knife, somewhat more slender than the cataract knife of Von Graefe, is then introduced on the temporal side in clear cornea, near the limbus, and is passed quickly across the anterior chamber, horizontally in front of the iris, and is brought out at a corresponding point in clear cornea on the nasal side, and the incision is then completed, if necessary, by a to-and-fro movement of the knife. The length of the incision should involve about two fifths of the circumference of the cornea. Some operators, in completing the corneal incision, make a small conjunctival flap as a protection against secondary infection from the conjunctival *cul-de-sac*. I never make such a flap if it can be avoided, as I regard it as a useless complication unless the patient has a chronic conjunctivitis or dacryocystitis; and it undoubtedly increases the danger from primary infection by enlarging the wound. In making the corneal section, care should be taken to pass the knife quickly across the anterior chamber, and thus complete the section as rapidly as possible. This prevents almost entirely the escape of aqueous humor prematurely, and there is but little danger that the iris will fall over the edge of the knife and be divided. If the iris prolapse outside of the wound as soon as the section is completed, it may either be left untouched until the lens has been extracted, or it may be restored to its place in the anterior chamber before opening the capsule. The capsulotome, or angular cutting knife or needle, is then introduced and carried well behind the inferior margin of the sphincter of the iris, and the capsule is then lacerated by a T shaped

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incision, or, better, by a quadrilateral one, care being taken to avoid wounding the iris.

The extraction of the lens now follows. This is effected by pressure on the eye above the wound, and counter-pressure on the lower portion of the cornea by spatula or rubber spoon. This causes a gaping of the wound and a revolution of the lens upon its horizontal axis, the upper margin of the lens coming forward and presenting in the wound. A brief continuance of this pressure and counter-pressure causes the extrusion of the lens, and a more or less extensive prolapse of the iris. It is perhaps safer to remove the speculum before this manoeuvre is attempted, so as to avoid as far as possible the danger of prolapse of the vitreous. This should always be done in cases of complicated cataract, especially when the suspensory ligament is defective, and the vitreous disorganised, or the lens partially dislocated.

The next step, a very important one, is the removal of the remnants of soft lens matter or cortex, if there are any, from the anterior chamber. This is best done by pressure with the fingers upon the eyeball, through the closed lids, or by curette, or spoon or spatula, by repeated slow movements of the instrument over the cornea from below upwards towards the wound, or by repeated and continuous rotary massage of the lids upon the eyeball. These manoeuvres should be accompanied by frequent irrigation of the conjunctival *cul-de-sac*, and even of the anterior chamber, by a warmed saturated solution of boric acid, or by Pana's fluid. It is very rarely necessary to introduce any instrument into the anterior chamber.

The next step is the replacing of the prolapsed iris. If the iris has not spontaneously reduced itself during the manipulations employed for removing the lens fragments from the anterior chamber, it may be readily replaced or reduced by a gentle stroking with a smooth probe or spatula. If on reduction of the prolapsed iris, the pupil is neither central nor round, some surgeons consider it advisable to do an iridectomy at once, so as to avoid the necessity of doing it later.

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But it is much better to so choose your cases for simple extraction as to exclude all such cases as may possibly necessitate an iridectomy.

For the irrigation of the anterior chamber, any small lachrymal syringe may be used, but it should always be sterilised and kept exclusively for the purpose. The nozzle should be introduced between the lips of the wound, and the fluid used should be injected very slowly and gently, and in small quantities. Instead of the syringe, a small rubber balloon, carefully sterilised and then filled with the fluid, may be used, or we may prefer the small glass irrigating bulb known as the Undine.

The final steps in the operation, before the application of the bandage, are a careful irrigation of the lids and conjunctival *cul-de-sac* with the boric acid solution, and the instillation of a few drops of a solution of eserine sulphate (½ grain to the ounce) into the *cul-de-sac*, or the application of an ointment of eserine of the same strength. This causes a contraction of the pupil, and thus aids in preventing a secondary prolapse of the iris. The lids of both eyes are then closed, carefully and smoothly covered with a wad of antiseptic cotton, and a double roller flannel bandage applied over both eyes.

The after treatment varies somewhat with the nature of the case and the temperament of the patient. The patient is to be kept in bed on an average for three or four days. He is allowed to sit up while eating, and to rise from bed to satisfy the calls of nature. The room need not be darkened. The bandage and dressing are usually removed on the next day, but without opening the eyes. The edges of the lids are to be gently cleansed with a saturated solution of boric acid, or a solution of mercuric bichloride (1-5000), and a drop of a solution of eserine sulphate is to be introduced. If there is much mucous secretion, or any swelling of the lids, the lids are to be opened, the conjunctival *cul-de-sac* and eyeball carefully irrigated with the warmed boric acid solution, and then the eye carefully inspected. If, on the contrary,

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the lids look well, and there is no secretion, the eye is not inspected until the fourth or fifth day, but the dressings are renewed and the lids cleansed daily. If on the fourth or fifth day the pupil is round and central, the eye is carefully cleansed; and if the wound has closed throughout its entire length, the bandage is discontinued except at night, and then is used only on the operated eye. The eye not operated upon is usually left uncovered after the second or third day, if the pupil is round and central and the wound closed. But if circumcorneal injection or pain is present, a weak solution of atropia should be used at once, several times daily, until both these symptoms have subsided.

A few words now in regard to the accidents which may occur in the course of the operation.

1. The iris may fall upon the edge of the knife in its passage across the anterior chamber, and may be wounded or excised as the corneal section is completed. This accident may happen to any surgeon. The rapid passage of the knife across the anterior chamber to its point of exit in the cornea on the opposite side, and the avoiding of any undue pressure on the eyeball by the fixation forceps, will go far towards preventing the occurrence of this accident. The rapid completion of the corneal section also aids in this endeavour. Should the iris be cut or excised in this first step of the operation, an iridectomy must be done at once, and the artificial pupil thus made clean and smooth.

2. Prolapse of the vitreous. This may occur at any period during the operation, and is always a misfortune. In the hands of a careful operator it is usually slight, and need not interfere with the usual careful manipulation for causing the extension of the lens. Any portion of vitreous that remains in the wound after the lens has been removed must be cut off, and great care must then be exercised in any manoeuvres undertaken for the purpose of extracting the remains of the cortex from the anterior chamber. It is well, also, in such cases to avoid all irrigation of the anterior chamber, as it would be very apt to increase the loss of vit-

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reous. Should the vitreous prove to be fluid and the prolapse extensive, the lens should be removed at once, either with the blunt hook or spoon, and the eyelids at once closed temporarily for a few minutes. Then the iris should be replaced, eserine instilled, and both eyes closed with the usual antiseptic dressing and bandage.

8. More or less extensive haemorrhage into the anterior chamber. This may in great part be prevented by avoiding the conjunctival flap. If the haemorrhage come from a wounded iris, the latter is to be smoothly excised, and then the farther steps of the operation are to be interrupted until the haemorrhage has been controlled, and the blood, as far as possible, removed from the anterior chamber, as its presence interferes with the proper opening of the capsule and the removal of the lens.

There are several complications or anomalies of the healing process which will be considered in the order of their frequency.

1. Posterior synechiae, or adhesions of the posterior surface of the iris to the remains of the anterior capsule of the lens. These are very common, and are in many cases filliform or thread-like in character. They rarely obstruct the pupillary area. They are caused by the edges of the lacerated anterior capsule coming in contact with the pupillary margin of the iris, which has already been bruised in the passage of the lens through the pupil. These adhesions occur independently of any actual iritis.

2. Iritis, usually of the mild, plastic type, and very often involving only a segment of the circumference of the iris. This is best combated by a weak solution of atropine and warm applications.

3. More or less complete obstruction of the field of the pupil by the opaque or thickened posterior capsule of the lens. This is a very common complication of the healing process, and usually requires some operative interference, such as discission, or some more serious surgical procedure, to be described later.

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4. A more or less irregular pupil, usually oval, caused by a puckering of the iris in the upper part of the angle of the anterior chamber, without there being any actual adhesion or incarceration of the iris tissue in the lips of the corneal wound. For this there seems to be no remedy of any actual value.

5. Incarceration of the iris in the corneal wound, or else merely anterior synechiae; a more or less marked adhesion of the iris to the inner lips of the wound. The use once or twice daily of a drop or two of a half-grain solution of eserine sulphate sometimes succeeds in breaking these adhesions, though more frequently it does not succeed; and it may prove disadvantageous by causing irritation of the iris, and even iritis, and thus increase the chances of posterior synechiae.

6. Secondary prolapse of the iris. If this occur early and prove irreducible, it should be cut off as neatly as possible, and the edges stroked gently into place in the anterior chamber. If the wound has already partially closed, and the prolapse of the iris is a late occurrence, it is better to leave it undisturbed by any manipulation. This secondary prolapse of iris is almost always of traumatic origin, from some sudden jar, or displacement of the bandage on the part of the patient, and its prevention depends largely on careful nursing. Great care in operating, and the rigid exclusion of all unsuitable cases, such as rigidity of the iris, prolapse of the vitreous, dislocation of the lens, or unmanageable patients, will all undoubtedly aid in reducing the cases of secondary prolapse of the iris to a minimum.

7. Capsulitis, or inflammation of the capsule of the lens. This is almost always of the mildly plastic character, and is usually associated with the mild form of iritis. Should it prove to be of the suppurative type, it is almost invariably accompanied by a purulent inflammation of the iris, and infiltration of the tissue of the cornea in the vicinity of the wound, and is always the result of secondary infection from without.

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8. Suppuration of the lips of the corneal wound. This is always the result of secondary infection, and, if not combated at once, may end in total loss of the eye from suppurative panophthalmitis. Its cause is usually some chronic inflammation of the palpebral conjunctiva, or lachrymal sac, and it should be treated at once by removal of the dressings and bandage, frequent irrigation of the wound, eyeball, and *cul-de-sac* with a hot solution of mercuric bichloride (1-5000 or 1-3000), and prompt cauterisation of the entire length of the wound by the galvano-cautery. This may be repeated daily, if the surgeon deem it necessary, as long as it seems to influence favourably the course of the suppurative process. If the latter increases in extent in spite of hot fomentations and the cautery, the latter does no good, and should be discontinued.

An important factor in the restoration of good visual acuity in cases of cataract extraction is the performance of what are called secondary or after-operations. These are usually of two kinds, viz.,—1st. Discission, or laceration of the posterior capsule. 2d. Excision of a piece of thickened capsule, or of a piece of membranous tissue, composed of thickened capsule and the products of inflammatory exudation. The gain in sight from a secondary operation is often very great.

Discission or laceration of the posterior capsule is very often, perhaps in the majority of cases, necessary, but is sometimes dangerous. It is a delicate operation, requiring great care in manipulation, good judgment, and perfect sight on the part of the surgeon, a sharp knife-needle, and a good light. It is sometimes necessary to employ the electric light in this delicate operation. The capsule may be lacerated by a simple stop-needle with a double cutting edge; but by far the best instrument is a delicate, sharp, curved knife-needle, with a sharp point and a curved cutting edge shaped something like a sickle. This is plunged through the cornea on either side near the limbus, and the capsule is then lacerated by a single vertical or transverse stroke of the blade; or, if necessary, a crucial incision is made through the capsule.

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Under cocaine this may be done by a good operator without the employment of fixation forceps; and this is an advantage, as all undue pressure upon the eyeball is thus avoided.

The danger of the operation is proportionate to the density and duration of the pupillary capsular membrane. A capsule which is not thickened by the products of inflammation can be lacerated easily and without much danger, but pseudo-membranous opacities, resulting from iritis or iridocyclitis, must be approached with caution.

This leads to a brief consideration of the second variety of after-operations, namely, excision of a piece of thickened capsule or of a pseudo-membrane, and its removal from the field of the pupil and the interior of the eye. This may be done by making an incision in the cornea, near the limbus, and employing the narrow cataract knife or Beer's triangular knife to cut out a triangular piece of the opaque membrane, which is then to be removed by Tyrrell's blunt hook; or by the introduction of Wecker's knife-scissors through the corneal wound, and the excision of a triangular piece of membrane. This is an extremely delicate, somewhat difficult, and dangerous operation, as the manoeuvre may set up a fresh attack of iritis or iridocyclitis, with possibly subsequent closure of the gap made by the knife, or by somewhat rapid phthisis bulbi or atrophy of the globe.

Some variations in the general technique of the operation of extraction of cataract without iridectomy have been proposed by different surgeons. Panas always employs an alcoholic solution of the biniodide of mercury as an antiseptic fluid for the irrigation of the anterior chamber. Some writers have used a solution of mercuric bichloride (1-10000) for the same purpose. Knapp found that when small quantities of the latter were employed there was no reaction, but that the injection into the anterior chamber of moderate quantities was followed by more or less transient opacity, appearing in patches on the posterior surface of the cornea. He has, therefore, abandoned its use in favor of Pana's fluid, or a saturated solution of boric acid.

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Most surgeons make the incision in the cornea in its upper section; and this is undoubtedly wise, as the chances of secondary prolapse of the iris or loss of vitreous are much diminished, and because the corneal scar, if there be any, is partially concealed by the normal position of the upper lid. Another modification of the technique of the operation, as described in this paper, is in the manner of opening the capsule, which consists in lacerating the capsule with the point of the cataract knife while making the corneal section. This is a revival of a method practised many years ago by Wenzel and other German surgeons, the capsule being split horizontally in the upper portion of the pupillary space. It was thought that it simplified the operation of extraction, and it certainly demands one instrument the less. It is a difficult manoeuvre to perform, and may cause the corneal wound to be irregular and even ragged, and thus protract the healing process. If the capsule were thick, the knife would probably fail to penetrate it, and there would be some danger of causing rupture of the zonula and dislocation of the lens. It would be a very difficult manoeuvre if the pupil were narrow and the anterior chamber shallow, and the iris would probably be wounded in such a case. In the opinion of the writer, this method of opening the capsule should be abandoned.

The advantages of simple extraction without iridectomy are as follows:

1. It preserves the natural appearance of the eye, giving a central, circular, and movable pupil. 2. The acuteness of vision, other things being equal, is greater than after the old operation. 3. Eccentric vision and orientation are much better than by the old operation. 4. Small particles of capsule are not so likely to be incarcerated in the wound, and thus act as foreign bodies and excite irritation. 5. The necessity of after operations is probably not so great as after the old operation.

The disadvantages of this method are,—

1. The technique of the operation is decidedly more diffi-

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cult. The corneal section must be larger in order that the extrusion of the lens may be facilitated, as the presence of the iris acts as an obstacle to its passage. The corneal section must be performed rapidly, so as to avoid the danger of the iris's falling on the knife and being excised. The cleansing of the pupillary space and the posterior chamber is much more difficult than after the old operation. 2. Posterior synechiae, secondary prolapse, and incarceration of the iris are more frequent than after the old operation. 3. The operation is not applicable to all cases. This objection, however, applies to all operations.

The indications for performing an iridectomy in cases of cataract extraction may be formulated as follows:

1. When the vitreous is fluid or the zonula is ruptured, causing non-presentation of the lens in the wound and prolapse of the vitreous. 2. Insufficient length of the corneal section with prolapse of the iris. 3. Bruising of the iris during the operation. 4. A stiff, unyielding sphincter iridis. 5. Irreducible prolapse of the iris after the completion of the operation.

A few words in regard to the employment of general antiseptic rules:

1. The removal and exclusion as far as possible of all bacteria by the employment of unirritating, aseptic fluids for all purposes of cleansing and irrigation, the best of these being boiled water or boiled boric acid solution. 2. The employment, whenever necessary, of some really valuable antiseptic solution, such as chlorine water, mercuric bichloride, or silver nitrate, the indications for their use being the appearance of the slightest muco-purulent secretion from the conjunctiva, or cloudiness of the lips of the wound. 3. The fearless employment of the galvano-cautery to the whole length of the corneal wound, if the lips of the wound show any sign of infiltration. 4. The performance of the operation with the most extreme neatness and accuracy, and with the minimum of traumatism. 5. Endeavour to obtain primary union of the wound by careful removal from between its lips of all foreign

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substances, and by perfect coaptation of its edges, and by the maintenance of the most complete immobility of the organ possible until the wound is firmly closed.

Of the one hundred eyes upon which this operation of the "simple extraction" of cataract was performed, useful vision was regained in all except one. This case was a patient whose eye had been rendered entirely blind by frequent attacks of irido-choroiditis, and the lens was removed simply to allay the severe pain, and possibly to aid in quieting the inflammatory process. Not a single eye was lost from suppuration. Fifty-two of the patients were males and forty-eight were females. The youngest patient was thirteen years old, and the oldest was eighty-seven. The complications existing were as follows:

Corneal macula or opacity in nine cases; broad arcus senilis in nine cases; old chorio-retinitis in six cases; chronic Bright's disease in five cases; chronic bronchitis and asthma in four cases; diabetes mellitus in two cases; dilated and immovable iris from a contused wound in two cases; conjunctivitis and marginal blepharitis in two cases; iridochoroiditis and blindness in one case; posterior synechiae from old iritis in one case; pulmonary phthisis in one case; hypertrophy and valvular disease af the heart in one case.

The reduction of the prolapsed iris after the extraction of the lens occurred spontaneously in fifty-six cases, and the iris was replaced by the spatula in forty-four cases.

In eighty-three cases there was neither incarceration nor secondary prolapse of the iris.

In fifty-three cases there were no posterior synechiae or adhesions of the iris to the lacerated capsule. In forty-seven cases these adhesions were present, and in ten of these they were due to plastic iritis.

The healing process was perfectly normal in eighty-six cases, though in some the process was very slow, especially in the closure of the external lips of the wound. Iritis of the mild plastic type occurred in ten cases, and retraction of the iris towards the ciliary processes in three cases. There

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was loss of corneal epithelium in two cases, and "striped" keratitis in one case. The wound became infiltrated in three cases, necessitating the use of the galvano-cautery. Choroiditis and hyalitis occurred in two cases, and irido-choroiditis with occlusion of the pupil also in two cases. Capsulitis followed in one case.

The accidents which occurred during the operation were as follows:

1. Loss of vitreous in thirteen cases. 2. Haemorrhage into the anterior chamber in two cases. 3. Complete collapse of the cornea in two cases. 4. Dislocation of the lens in three cases. 5. The lens was removed with the blunt hook in five cases.

The duration of the treatment varied from eleven days, the shortest period, to forty-seven days, the longest period.

Secondary, or after operations, were done in fifty-three cases, discission or laceration of the capsule in fifty cases, and excision of a piece of capsule or membrane in three cases.

The resultant degree of vision in the one hundred cases was as follows: $\frac{20}{20}$ in six cases; $\frac{20}{30}$ in thirteen cases; $\frac{20}{40}$ in twenty-four cases; $\frac{20}{50}$ in twenty-two cases; $\frac{20}{70}$ in twenty-one cases; $\frac{20}{100}$ in ten cases; $\frac{20}{200}$ in two cases, counting fingers at several feet in one case.

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DISCUSSION ON THE NEW HYPNOTICS, SULPHONAL; AMYLENE HYDRATE; HYDROBROMATE OF HYOSCINE; HYPNONE; PARALDEHYDE; URETHRAN.

REMARKS INTRODUCTORY TO A DISCUSSION ON THE NEW HYPNOTICS.

By WILLIAM H. FLINT, M. D., of New York County.

Poets and philosophers have ever bestowed well deserved encomiums upon sleep, which the encyclopedic Shakespeare calls "Nature's soft nurse," and, again, "chief nourisher in life's feast." Physicians, also, recognising natural sleep as an invaluable ally in combating disease, have regarded hypnotic medicines as among the most effective weapons of their therapeutic *armamentarium*, and have eagerly welcomed and tested new soporific remedies. The number of available sleep-producing medicaments has happily been considerably augmented of late by new discoveries in the domain of synthetical chemistry, and by the utilisation of certain compounds long known to science.

The object of the present discussion is to give a summary of the therapeutic applications, the contra-indications, the toxicology, the modes of administration, and in some cases the physiological action, of these newer hypnotics, with a view to throwing light upon the relative merits of the individual remedies. The writer has aimed at accomplishing his part of this task by presenting a *résumé* of the most important papers on these subjects which have come to his notice; to which summary he has appended the results of his own observations. The group of somnifacients to which your attention is invited embraces sulphonal, amylene hydrate, paraldehyde, urethran, and hypnone.

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I. SULPHONAL.

This is almost the latest aspirant to recognition as a simple hypnotic, and has for a year and a half formed the subject of many contributions to therapeutical literature. Some of the earlier articles are too well known to require extended mention, but, for the sake of completeness, will be briefly referred to.

Sulphonal was discovered by Prof. E. Baumann, of Freiburg University, and was first made the object of experiment by Prof. A. Kast, of the same university.[1]

Prof. KAST'S experiments with dogs having led him to the conclusion that sulphonal chiefly affects the *cortex cerebri*, and having demonstrated the harmlessness of the remedy, even in large doses, and its freedom from after-effects, he then experimented with healthy human subjects. In these subjects he found that it did not produce sleep in persons free from mental and bodily fatigue, but that it encouraged or inaugurated slumber in those already tired and sleepy, or in those who, being over-tired, could not go to sleep. The next investigations were undertaken with patients suffering from insomnia due to various causes, as fever, nervous unrest, insanity, organic nervous and cardiac diseases, and old age. Prof. Kast thus made one hundred and twenty trials of sulphonal in about thirty cases, using from 15 to 45 grains at a dose. Calm sleep was produced in from half an hour to two hours, and continued from five to eight hours. This sleep was not followed by any discomfort, or by any derangement of the functions. Continued use of the remedy did not seem to engender a habit, or to necessitate the employment of doses larger than those first used.

Dr. G. RABBAS[2] employed sulphonal two hundred and twenty times in twenty-seven cases of insanity, some of them of a very severe and violent type. He drew the conclusion, from his cases, that sulphonal, in doses of from 30 to 45 grains, is superior to either amylene hydrate, or paraldehyde, even

[1] Berlin Klin. Woch., No. 16, April 16, 1888. p. 309.
[2] Berlin Klin. Woch., No. 17, April 23, 1888, p. 330.

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when the latter are given in much larger doses. Natural sleep was produced in Rabbas's cases in from one half to 1 or 2 hours, and lasted 6 or 8 hours, or even longer. Rabbas emphasised the advantages possessed by sulphonal for use with the insane, because of its freedom from odour and taste. He observed no unpleasant concomitant effects or sequels from doses of sulphonal, although it did not always produce sleep.

Drs. LANGGAARD and RABOW[1] reported their experience with sulphonal on themselves and others, the number of cases not being stated. They used from 15 to 30 grains. Natural sleep resulted in from one half to 1 hour after the exhibition of the remedy. On awaking, the patients had a feeling of comfort, and did not complain of any unpleasant after-effects. They used sulphonal with particularly happy results in nervous sleeplessness, and for night travellers by rail, who were disturbed by the noise and commotion of the trains. Their experience seemed to show that often patients not only do not become accustomed to sulphonal, thus requiring larger doses, but are able to obtain sleep from smaller doses than those first employed. They laid stress upon the fact that sulphonal may be successfully used, in the night, after vain efforts to sleep have been made, under which circumstances most soporifics fail, and particularly recommend sulphonal for the insane, because it is tasteless and odourless. They insist upon the necessity of using a perfectly pure article, as some specimens, which varied but slightly from the standard melting-point (257.9° F.), proved perfectly inert.

Dr. T. E. LOVEGROVE[2] reported very discouraging results from the use of sulphonal. His patients remained unaffected by the drug for hours, but suffered during nearly the whole of the following day from drowsiness, and even from cyanosis.

Drs. J. C. WILSON and R. HUTCHINSON[3] tried sulphonal in a few cases of severe insomnia and of violent mania, with entirely negative results.

[1] Therap. Monatshefte, May, 1888, p. 287.
[2] Brit. Med. Jour., May 26, 1888, p. 1113.
[3] Med. and Surg. Reporter, June, 1888, p. 788.

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Dr. W. MACVIE[1] used 15 gr. doses of sulphonal with good results, particularly with women in acute diseases, although 30 grains were often required by plethoric men. He concluded that sulphonal does not injuriously affect either the stomach, the lungs, or the heart, and that a sulphonal habit does not exist.

Dr. G. STEWART[2] obtained very fair success with sulphonal. He gave from 15 to 30 grains at 5 P. M., and found that the drug's hypnotic action was exerted at the usual bedtime.

Dr. C. OESTREICHER[3] used sulphonal one hundred and twenty-eight times for fifty patients, chiefly cases of insanity, of other nervous diseases, and of the opium habit. He employed doses of from 30 to 45 grains, given some hours before bedtime, owing to its slow action. He considers sulphonal a perfectly safe hypnotic, less powerful than chloral, but preferable to amylene hydrate and paraldehyde, because devoid of taste and of odour. His results in cases of the opium habit were very encouraging.

Dr. H. ROSIN[4] employed sulphonal two hundred and seventy-four times in eighty-two cases of insomnia. He found 15 grains to be practically useless, but 30 grains to be almost always successful, and to be devoid of unpleasant *sequelae*. He even used 60 grains in several cases, without untoward results, other than some giddiness and somnolence lasting twenty-four hours. He frequently found sulphonal efficacious in insomnia, due to the cough of phthisis. In patients with cardiac disease sulphonal did not appreciably affect the heart's action. Dr. Rosin noticed that the effect of large doses was felt on the second night after their administration, causing patients to sleep much better than when sulphonal had not been given on the preceding evening. In a few of his cases, fatigue, depression, and mental confusion followed the use of sulphonal.

[1] Med. Press and Circular, June 13, 1888, p. 606.
[2] Med. Press and Circular, June 13, 1888, p. 611.
[3] Berlin Klin. Woch., No. 25, June 18, 1888, p. 501.
[4] Berlin Klin. Woch., No. 25, June 18, 1888, p. 499.

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Dr. A. CRAMER [1] used sulphonal four hundred and seven times, with forty-nine patients suffering from mental diseases, and obtained excellent results in 92.6% of his cases. Natural sleep, in many cases of five hours' duration, was induced, even in violent mania. The doses ranged from 30 to 45 grains, and the drug was often mingled with the food, and taken without the patient's knowledge. The remedy was used for several consecutive weeks without ill effects, no dyscrasia or habit being thus engendered. In melancholia, sulphonal, in quantities of from 30 to 60 grains, given in divided doses throughout the day, produced a feeling of quietude devoid of fear or melancholic foreboding. At night these victims of melancholia would sleep five or six hours uninterruptedly. In periodical mania the same happy results were attained.

Dr. J. SCHWALBE [2] reported on fifty cases of insomnia treated with sulphonal. Twenty-three were cases of nervous insomnia, and in twenty-one of these, or 90.3%, the results were perfectly satisfactory. His conclusions are as follows: (1) Sulphonal is a pleasant hypnotic, owing to its freedom from odour and taste. (2) In nervous insomnia, it is promptly effective in doses of from 15 to 30 grains. (3) Sulphonal affects neither temperature, pulse, nor respiration, and, on this account, is preferable to morphia and chloral in fevers and in diseases complicated by heart weakness; it may also be used for children. (4) No significant after-effects result from the use of sulphonal. Schwalbe observed dizziness, headache, nausea, and, in one case, vomiting, after a dose of only 22 grains.

Dr. REGIS [3] reported a few cases of hysterical excitement, in which sulphonal was useless.

Prof. A. KAST,[4] in his second article on sulphonal, gave the results of his experiments on dogs, made with a view to ascertaining the best mode of administration of the hypnotic,

[1] Münch. Med. Woch., No. 24, June 12, 1888, p. 395; Deutsch. Med. Woch., No. 25, 1888, p. 515; and Neurolog. Centralbl., 1888, p. 430.
[2] Deutsch. Med. Woch., No. 25, June 21, 1888, p. 499.
[3] Jour. de Med. de Bordeaux, July 1, 1888.
[4] Therap. Monatshefte, July 2, 1888, p. 316.

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and concluded that the highest soporific effects are attained when sulphonal is given, finely powdered, early in the evening, say at 7 or 8 o'clock, with the last meal, or with hot tea, soup, milk, or broth. The hydrochloric acid, peptones, and salts present in the stomach, under these circumstances, are held by him to favour the rapid solution of the sulphonal. He believes the relatively slow action of sulphonal to be due to its great insolubility and to its very stable chemical character. He insists upon the necessity of carefully determining the appropriate dose for each patient.

Dr. J. FRÄNKEL[1] used sulphonal in several cases of insomnia, mostly insane patients. The doses varied from 15 to 45 grains. Sleep generally ensued within an hour, sometimes not for two or three hours. In a few cases sulphonal failed, and in several, it caused great fatigue and mental confusion.

Dr. SCHMEY[2] reported a case of angina pectoris, due to arterio-sclerosis, in which sulphonal seemed greatly to aggravate the paroxysms of angina, which were held in check by amyl nitrite. Schmey therefore advises that the drug be not used in arterio-sclerosis and angina.

Dr. G. MÜLLER,[3] however, describes the case of a man, 72 years old, with well marked arterio-sclerosis and extreme dyspnoea, who was relieved from the dyspnoea, and obtained natural sleep after taking 15 grains of sulphonal. He holds that Schmey's results were merely accidental.

Dr. SPILLMAN[4] reported several successful cases, in which no fatigue or hebetude followed the use of sulphonal. His doses were from 15 to 30 grains.

Dr. LEHMANN[5] recommended sulphonal for insomnia due to asthma; and MARTIN (*ibid*) for the night-sweats of phthisis, stating that 7½ grains at bedtime produced quiet and natural sleep of from four to six hours' duration.

[1] Berlin Klin. Woch., July 23, 1888, p. 611.
[2] Therap. Monatshefte, July, 1888, p. 319.
[3] Therap. Monatshefte, August, 1888, p. 378.
[4] Revue Med. de l'Est, August, 1888.
[5] Münch. Med. Woch., July 10, 1888, p. 478; Med. News, Aug. 4, 1888, p. 130.

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Dr. SALGÓ[1] obtained good results from sulphonal in nervous insomnia, and in sleeplessness due to melancholia, epilepsy, the opium habit, and hypochondriasis, but not in paralytic dementia. For the last named cases, he preferred chloral. In some of his cases Salgó obtained only slight or negative results from sulphonal. He never saw any bad effects from the drug.

Dr. OTTO-DALLDORF[2] obtained satisfactory results from sulphonal with the insane. In some cases, however, after doses of 30 grains, fatigue, vertigo, and slight unsteadiness in standing or walking were noted on the day following the use of the drug. In chronic insanity he tried the continuous administration of sulphonal, using from 37 to 75 grains in divided doses *per diem*. The results were, in the main, excellent. The soothing effect of the sulphonal was apparent sometimes from the first day, generally from the second day, and increased during the treatment. In rare instances, an ataxic gait and vertigo followed daily doses of 45 grains.

Dr. HILSMAN[3] reported considerable success with sulphonal in cases accustomed to chloral, morphia, paraldehyde, and other hypnotics.

Dr. L. L. JOHNSON[4] reported a case of confirmed insomnia of twenty years' standing. The patient obtained only from one to three hours' sleep *per diem*, and was contemplating suicide. The first dose of sulphonal (20 grains) produced natural sleep, which lasted eight hours. Subsequently, 15 grains sufficed.

Dr. A. OTT[5] reported favourably on sulphonal, although in his hands 45 grains sometimes failed, and in some cases caused vomiting and faintness. He regards sulphonal as valuable, yet not devoid of danger, and not invariably reliable. He advises beginning with small doses, in view of individual idiosyncrasies.

[1] Wien. Med. Woch., No. 22, 1888, p. 747; Therap. Gaz., Aug., 1888.
[2] Deutsch. Med. Woch., Aug. 23, 1888, p. 707.
[3] Gaz. Hébdom., de Sci. Méd., Montpellier, Sept. 1, 1888.
[4] Med. News, Sept. 8, 1888, p. 266.
[5] Prag. Med. Woch., No. 40, 1888, p. 432.

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Dr. M. MATTHES[1] employed sulphonal in twenty-seven cases at Prof. Ziemssen's clinic, Munich. His report contains an analysis of the sphygmographic pulse curves, taken after the use of sulphonal. These curves fail to show anything abnormal, even after 60 or 75 grains of sulphonal. Matthes prefers sulphonal to all other hypnotics. In 72% of his cases he obtained at least six hours' sleep; in 19% it was incomplete in its action; in 9% it failed; and in 20% there were fatigue, malaise, *tinnitus*, headache, and vertigo after its use. In two cases there was vomiting.

Dr. G. ALGERI[2] reported fifteen cases of acute mania, of imbecility, melancholia, dementia, epilepsy, hallucinations, and of acute alcoholism, treated with sulphonal. In almost every instance healthy sleep, lasting from two to five hours, resulted from the use of from 15 to 60 grains of sulphonal, and was not followed by any bad after-effects, except lassitude, the next day.

Dr. B. SACHS[3] reported sixty trials of sulphonal on fifteen patients. His conclusions are as follows: (1) Sulphonal is valuable in functional insomnia, restoring the natural desire for sleep. (2) It is well borne by the stomach, and does not produce cephalalgia, except in doses of 45 grains and upward. It has no effect upon the circulation, and may be given in cases of irritable and fatty heart, and in fevers, in all of which respects it appears to be superior to other hypnotics. (3). It has slight or no narcotic virtues. (4) It sometimes seems to lose its effect after prolonged use.

Dr. ENGELMAN[4] was the first to report any decidedly objectionable result from sulphonal. This was a diffuse, itching, scarlet eruption under both breasts, which appeared in the morning after 30 grains of sulphonal had been given at bedtime. On the second day the eruption extended to the abdomen, and grew confluent. On the third day the eruption disappeared. It was referred to vaso-motor disturbances.

[1] Centralbl., f. Klin. Med., 1888, p. 723.
[2] La Reforma Medica, Oct. 8, 1888.
[3] Med. Rec., Oct. 6, 1888, p. 416.
[4] Wien. Med. Blätt., Nov. 1, 1888; Therap. Gazette, Jan. 15, 1889, p. 25.

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Dr. G. W. ROCHEL[1] reported seventeen cases of insomnia from varied causes, among them pain, cough, and dyspnoea, in which from 15 to 30 grains of sulphonal acted as a prompt and efficient hypnotic.

Dr. T. ZERNER[2] used sulphonal with impunity in arteriosclerosis. He holds that sulphonal does not act injuriously upon the heart or the stomach, but that it sometimes produces an ataxic gait, and sometimes slightly relieves pain. He states that unpleasant after-effects follow sulphonal in from 10 to 12% of all cases.

Dr. BORNEMANN[3] gave 60 grains of sulphonal to a patient addicted to the morphine habit, at 9 P. M., and 30 grains at 1 A. M. There resulted marked muscular incoördination, with great mental depression, lasting, to some extent, for six days. Similar results were reported by ZIEHEN and by FISCHER.[4]

Dr. JOSEPH FRANZ[5] reports two hundred and sixty trials of sulphonal on eighty-two patients in the surgical wards of Prof. Schoenborn, at Würzburg. His conclusions are that sulphonal is unsurpassed for the relief of nervous sleeplessness, and that it is, to a slight extent, an anaesthetic.

Dr. M. MATTHES[6] published the results of a second series of experiments made with sulphonal at Ziemssen's clinic, in Munich. Ninety-nine single doses, usually of from 15 to 30 grains, were given to twenty-seven patients. In twenty-one cases (75%) the results were very good. Among the successful cases were those of heart disease, nervous insomnia, spinal meningitis, progressive paralysis, and neuralgia. In the other cases, embracing pernicious anaemia, phthisis, typhoid fever, and delirium tremens, sulphonal failed. In the majority of cases, after-effects were noted. These were fatigue, depression, headache, vertigo, and *tinnitus aurium*, and they disappeared on the following day. These effects

[1] N. Y. Med. Press, Nov., 1888.
[2] Wien. Med. Woch., Nos 45, 46, 1888, pp. 1514–1546.
[3] Deutsch Med. Zeit., Nov. 26, 1888.
[4] Neurolog. Centralbl., 1889, No. 7.
[5] Verhand d. Würz. Phys. Gesell., 1888.
[6] Wien. Med. Blätt, Dec. 13, 1888.

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were more pronounced if the sulphonal sleep was prematurely interrupted, and they were generally absent when the patient was allowed to lie quietly for some time after awaking. No relationship could be traced between the size of the dose and the severity of the after-effects, and there was no habit engendered. He concludes that sulphonal, although useful, is not thoroughly reliable, but preferable to other hypnotics on account of the absence of odour, of taste, and of marked toxic action. The usual dose is 15 grains, and it should be given an hour before sleep is desired to begin.

Dr. WM. H. FLINT,[1] the writer of this article, reported thirty-three cases treated with sulphonal, reaching the conclusion that sulphonal, even in single doses of 20 or 30 grains, is a safe and, in the main, reliable hypnotic, free from unpleasant concomitant effects, and usually from all undesirable sequelae. The only objectionable after-effect witnessed by the writer was moderate somnolence on the morning following the administration of the remedy. In none of the cases was there derangement of the appetite or digestion, nor were the circulation and respiration appreciably affected at the time of awaking. The cutaneous and renal secretions were neither increased nor diminished. Nausea, vomiting, and constipation did not follow the use of the drug. The average length of time at which sleep ensued after the administration of the sulphonal was about an hour. The average duration of the sleep was a little over six hours; and success attended the use of the remedy in about 82% of all the cases.

Dr. G. B. DOOLITTLE,[2] of Jeansville, Pa., reported thirty cases of primary and secondary insomnia, treated with thirty grain doses of sulphonal. The results were uniformly good. In all but one case sleep ensued in an hour, and lasted from four to eight hours. In only one case were unpleasant after-effects observed. These were languor, mental hebetude, and loss of appetite, in a patient who had taken 60 grains.

Dr. SCHOTTEN[3] reported the case of a woman, aged 45

[1] N. Y. Med. Jour., Dec. 15, 1888.
[2] N. Y. Med. Jour., Dec. 22, 1888, p. 687.
[3] Therap. Monatshefte, Dec., 1888, p. 555.

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years, accustomed to the nightly use of chloral in 45 grain doses, to whom he gave, on two consecutive nights, thirty grains of sulphonal, with no effect save great fatigue on the following days. On the third night 45 grains were again given. This caused sleep, but was followed the next day by great fatigue, drowsiness, drooping of the eyelids, partial aphasia, difficulty in moving the tongue, anorexia, headache, and a badly tasting mouth. These symptoms lasted four days, although no more chloral or sulphonal was given, but the nights were sleepless. On the fourth day, an eruption, like that of measles, which was accompanied by heat and burning, began on the head, and gradually spread to the whole cutaneous surface, but did not involve the mucous membranes. In two days the eruption began to fade, but traces of it remained for over two weeks. The prolongation of the symptoms he refers to the great insolubility of sulphonal.

Dr. G. H. KISCH[1] reported twenty-four cases. His best results were obtained in twelve cases of nervous insomnia, in which doses of from 7 to 15 grains were sufficient to produce sleep lasting nearly all night. He obtained good results in 62.5% of the cases. In six cases there was no hypnotic effect, even from doses of 30 grains. In one case of hemiplegia, in which morphia did not cause sleep, 15 grains of sulphonal were quite successful; but the patient, on awaking, was aphasic, and remained so for from eight to ten hours. Another patient took 45 grains, in divided doses, during the night, and on the next day suffered from great depression. His pulse was also retarded, beating only thirty-eight times per minute.

Dr. S. GROVER BURNETT[2] reported sixteen cases of mental disease treated with sulphonal. He met with success in 75% of his cases. In one case of arterio-sclerosis, the patient being 59 years old and suffering from melancholia, he gave 60 grains of sulphonal in two doses during the night. After the second dose the patient slept eleven hours, but awoke nau-

[1] Berlin Klin. Wooh., No. 7, 1889, p. 128.
[2] N. Y. Med. Jour., March 2, 1889, p. 288.

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seated, cyanotic, and semi-comatose, remaining in this condition for twelve hours. In another case he observed incoördination in a lady 42 years old, after she had taken nightly doses of 30 grains of sulphonal for five days. On the seventh day the incoördination became so marked that the sulphonal was discontinued. In other cases, the drug caused great thirst, dryness of the mouth, anorexia, and emesis (in two cases). He concludes that sulphonal is reliable in psychoses, without depression, as in mania; while it is less well adapted to cases of melancholia with depression. It is contraindicated in arterio-sclerosis accompanying psychoses.

Dr. W. L. WORCESTER[1] used sulphonal in seventeen cases of insanity. His dose was 20 grains, and in only one case did it fail to produce sleep, which lasted, on the average, from five to eight hours. There were no bad sequelae. In one case sulphonal was used for thirty-six days, and in another, for twenty-three days. In neither of these was it necessary to increase the dose, but, on the contrary, the remedy seemed most effective toward the latter part of the treatment.

Mr. CONOLLY NORMAN,[2] of the Richmond asylum, Dublin district, used sulphonal in about thirty cases, of which he reported twenty-two. Bad results were noted in only two cases. There was no gastric or intestinal trouble. Self-abuse and erotic excitement were notably lessened by sulphonal. In recurrent insanity, the attacks seemed to be curtailed by sulphonal. In Norman's cases, the sleep was natural, the appetite remained good, and there were no troublesome head symptoms.

Dr. WM. F. SHICK[3] draws the following conclusions from his experiments with sulphonal in the private laboratory of Dr. Ott: (1) It does not affect the irritability of the motor nerves; (2) it does not affect the muscle curve; (3) the sensory nerves are left intact; (4) it depresses reflex activity mainly by its action upon Setschenow's centres. Occasionally it exalts reflex excitability; (5) it acts as a narcotic;

[1] Jour. of Am. Med. Assoc., March 9, 1889.
[2] Dublin Jour. of Med. Sci., Jan., 1889, p. 19.
[3] Jour. of Nerv. and Mental Dis., Jan., 1889.

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(6) the pulse is generally somewhat accelerated; (7) the arterial tension, after a temporary fall, is considerably increased; (8) the respiration is depressed, and section of the vagi does not alter this effect. In some of his experiments he has seen the heart paralysed in a few minutes when sulphonal was injected into the jugular vein. This effect, he thinks, may be partly due to precipitation of a part of the drug, as the fluid holding the sulphonal in solution was, when injected, warmer than the temperature of the blood.

Dr. ELON E. CARPENTER,[1] medical superintendent of the Long Island Home, Amityville, L. I., made a thorough test of sulphonal in thirteen cases of insanity, selecting for this purpose several of the most violent and destructive patients in the home, who were in the habit of taking narcotics nightly. His doses ranged from 15 to 45 grains; and, from the results of several hundred trials, he concluded that sulphonal is valuable in the insomnia of mental disease. He detected very little effect on the cutaneous or renal secretions. There was no constipation, but some nausea and emesis in the epileptic cases only.

Dr. C. M. REXFORD[2] reported favourable results from sulphonal in several cases of nervous insomnia, and saw no harmful after-effects. He says that sulphonal, although valuable, has its limitations. It does not often irritate the stomach. It may fail, or it may produce very unpleasant symptoms. Thus, in a case of chronic metritis, with weak heart, sulphonal acted well for a time in 15 grain doses at bedtime, but finally failed, and caused great restlessness. So, on one occasion, four hours after the first dose, a second dose of 15 grains was given, and the patient slept. The next day, however, she was unable to rise, was giddy, and could only walk or stand when assisted. She vomited and was drowsy all the next day. It was not until the end of three days that she was herself again.

Dr. WM. MAHON,[3] assistant physician State Lunatic Asy-

[1] Med. Rec., March 2, 1889, p. 289.
[2] Med. Rec., March 30, 1889, p. 348.
[3] Am. Jour. of Insan., April, 1889.

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lum, Utica, N. Y., made a series of experiments with sulphonal at his institution. The eighteen patients selected were particularly rebellious to the action of other hypnotics. He administered sulphonal 119 times, on 114 nights, as follows: In 15 grain doses, 26 times; in 30 grain doses, 81 times; in 45 grain doses, 9 times; in 60 grain doses, 3 times. On 83 nights, sleep lasted 6 hours or more; on 20 nights, from 3 to 6 hours; and on 11 nights, less than 3 hours. The sleep was natural on 97 nights, and restless or broken on 17 nights. In two cases, only, sulphonal failed. The time required to produce sleep averaged 1½ hour. The only unpleasant after effect was slight somnolence in two or three cases, and this did not recur when the drug was subsequently given to the same patients. The average dose required was 30 grains, and Dr. Mahon says that 15 grain doses are inadequate in such cases as his. The menstrua used were, at first, mucilage, and later, hot milk and hot gruel, which hastened the hypnotic effect of the sulphonal. Comparisons instituted by Dr. Mahon between sulphonal and other hypnotics, showed that in most cases the sulphonal sleep was the most satisfactory, being calmer, longer, and more refreshing than that caused by other hypnotics.

Dr. BÖTTRICH,[1] of Hagen, Westphalia, discovered by acciden that sulphonal suppresses night-sweats, acting like atropia, but being free from any unpleasant after-effects. Dr. Böttrich reported that 7½ grains usually suffice to arrest the sweats, and that the effects are somewhat lasting, the sweats being much less severe even after the use of the drug is discontinued.

Dr. J. P. CROZER GRIFFITH,[2] in a paper read before the College of Physicians, Philadelphia, May 1, 1889, collated the evidence found in medical literature regarding the disadvantages of sulphonal, and recapitulates as follows: (1) The hypnotic action of sulphonal usually develops very slowly, and (2) this action is very liable to be prolonged through a

[1] Lancet, April 27, 1889.
[2] Therap. Gazette, May 15, 1889.

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greater or lesser part of the next day; (3) it is hard to determine the safe and efficient dose in each case, and the dose may vary at different times in the same case; (4) the drug is apt to cause unpleasant secondary effects, which may even replace its primary hypnotic action. Chief among these effects are excitement, nausea, emesis, vertigo, headache, languor, exhaustion, depression, and a staggering gait. These effects may appear either after large or after quite small doses. (5) It very often fails to cause sleep, either in any dose whatever or in any amount which can be given with comfort to the patient. Dr. Griffith decidedly prefers paraldehyde, and especially amylene hydrate, when a rapid effect is required. When, however, the stomach is irritable, he recommends sulphonal.

Prof. MAIRET,[1] of the Montpellier faculty, reported his results with sulphonal in thirty-two cases of insanity. Out of twelve cases treated with 30 grain doses, only four obtained sleep. In these four cases, after the second or third day, the patients presented the appearance of men suffering from the effects of a long debauch. If sulphonal was then withheld, the sleep would be good for two nights without other medicine. The same effects, *i. e.*, stupor, depression, incoherence, suffusion of the eyes, and anorexia followed doses of 45, 60, and 75 grains, used for those patients who proved refractory to smaller doses. Prof. Mairet then devised a new and successful method of exhibiting sulphonal. This method consisted in giving large enough doses to cause good sleep for two or three consecutive nights, and then to continue with smaller doses until the resumption of larger ones became necessary. The larger doses usually employed were from 30 to 75 grains, and the smaller ones of 15 grains each. In some cases the smaller dose would prove efficient for four days, and in others, even for nine days.

Dr. VERHOOGAN[2] insists upon the value of sulphonal in cases of insomnia in which opiates are contraindicated. In

[1] Bull. Med. 1889, Nos. 25 and 26; Therap. Gaz., May 15, 1889.
[2] Lond. Med. Recorder, May 20, 1889.

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doses of 15 grains by rectum, sleep invariably followed within twenty minutes, and lasted about six hours. The patients had no disagreeable after-effects, and were improved by their sleep. Occasionally it was necessary to repeat the dose during the night. Verhoogan gave the drug in this way to one patient for six weeks consecutively. He claims that there are no contraindications to the use of sulphonal. Cardiac, renal, arthritic, and dyspeptic cases are all amenable to its influence, under all circumstances, and neither intolerance nor tolerance is to be feared. Verhoogan's usual dose was 15 grains, and this was always sufficient. He refers some differences in the effect of the drug to variations in quality.

Dr. LIBORIO LOJACONO[1] reported his results from sulphonal in insanity. Single doses were used of from 15 to 22½ grains for women and boys, in the evening, and 37½ grains in the daytime. For men, the evening dose was from 22½ to 37½ grains. The physiological action of the drug began in a half hour at night, and in 1 hour by day. The blood pressure was notably increased, but there was no great effect on the respiration or pulse, the digestion, the temperature, or the reflexes. In one case only, of melancholia, in which 30, 45, and 60 grains had been given on consecutive days, were there unpleasant effects, viz., nausea and depression for twenty-four hours. There was no cumulative action, and the dose did not have to be increased. The effects varied with the size of the dose and the time when it was taken. Thus, while doses of from 15 grains to 22½ grains produced little effect given in the daytime, they produced sleep of from five to eight hours' duration when taken at night. Thirty grains, taken in the daytime, gave only a few hours of broken sleep, but, taken at night, made the patient sleep well all night, and sometimes even all of the next night. In some cases, 37½ grains at night caused quiet sleep for the next two, three, or more nights. In *no* case did the remedy fail, and the largest doses required were 37½ grains at night, and 60 grains by day. The drug acted as a general sedative, as well

[1] Brit. Med. Jour., June 1, 1889; Therap. Gazette, July 15, 1889, p. 485.

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as a hypnotic. In acute mania, or in hysterical delirium, and in epileptiform convulsions, the paroxysms were either prevented or mitigated. In chronic insanity the effect was much less marked.

Prof. VON KRIES[1] showed that in dogs, even after very large doses, the blood pressure was not lowered, while toxic doses caused severe convulsions, passing into heavy sleep, deepening into coma, and ending in death after about ten hours.

Dr. C. M. HAYS,[2] assistant physician to the state asylum for the insane, Morris Plains, N. J., furnishes an important comparative clinical study of sulphonal and paraldehyde. Allusion will be made, in the writer's remarks on paraldehyde, to Dr. Hays's views regarding that drug. His subjects exemplified nearly all varieties of mental disease, viz., acute and chronic melancholia, acute and chronic mania, various dementias, periodic mania and circular insanity, general paralysis of the insane, alcoholic mania, and primary dementia. Dr. Hays made 1,313 trials of sulphonal with 166 insane patients. In 910 trials, 69.3%, sulphonal produced from six to nine hours' sleep; in 206, 15.6%, from three to five hours' sleep; in 197, 15.1%, no sleep. Dr. Hays concludes that sulphonal is most successful in epileptic dementia, and less so in acute melancholia. He holds that it is far more useful in mania than in depressed states, and that it does *harm* in any form of melancholia. He farther tested sulphonal in twenty cases of acute and chronic disease, in which pain, cough, dyspnoea, or fever was the cause of insomnia. These diseases were erysipelas, acute rheumatism, phthisis, acute abscess, suppurative tonsilitis, lead colic, cardiac dyspnoea, neuritis, and asthma. In these cases, one hundred and ninety trials were made, 42% being successful, 48% negative, and 10% uncertain. From one hundred and twenty observations on forty patients Dr. Hays found that sleep followed the administration of the sulphonal in sixty-three minutes, on the average. He believes

[1] Therap. Gazette, June, 1889, p. 377.
[2] Am. Jour. Med. Sci., July, 1889, p. 34.

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that the after-effects of sulphonal may be dangerous to life, being far more powerful and varied than those of paraldehyde. Thirty of his patients, or 18%, suffered from bad after-effects, the most common being lassitude, dizziness, vertigo, diarrhoea, emesis, great mental depression, incoördination, with feeble circulation and respiration. His deductions are, that sulphonal is less effectual than paraldehyde in the insomnia of acute or chronic diseases with pain, cough, dyspnoea, or fever; that sulphonal is useless in all depressed mental states, and contraindicated in acute melancholia. In "maniacal conditions" it is more satisfactory than paraldehyde; that sulphonal is worthy of a trial in general paralysis of the insane, but paraldehyde better in acute melancholia; that great physical debility, with insomnia, should contraindicate sulphonal; that, in 18% of the cases sulphonal intoxication appears; that the drug seems capable of being dangerous to life, and that, therefore, the initial doses should be small; that the effects of sulphonal are not always in proportion to the dose; and that sulphonal sometimes very seriously interferes with the normal bodily secretions, which paraldehyde does to a very much less degree.

Dr. T. LAUDER BRUNTON[1] is quoted as saying (in his Croonian lectures, published in the London *Lancet*) that "sulphonal appears to be one of the most effective of all the newly introduced hypnotics, and, although it does not, like morphine, compel sleep, it induces sleep in a pleasant manner, and has few disagreeable effects, and little or no danger."

Dr. M. H. FARMER[2] reported a case of dangerous collapse which immediately followed a dose of 15 grains of sulphonal, given soon after delivery to a strong primipara, aged 20. He could find no cause for the collapse except the sulphonal, since the labour was not protracted or complicated; and there was no haemorrhage. The patient rallied and recovered under the use of stimulants and of hot applications.

Since the writer's early experience with sulphonal was

[1] N. Y. Med. Jour., Aug. 24, 1889, p. 224.
[2] Weekly Med. Review, July 20, 1889.

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published, about a year ago, he has constantly employed it in private and in hospital practice, and it has continued favourably to impress him.

In reviewing his own experience, and that of the authors from whom he has quoted, he concludes,—

(1) That the *physiological action* of sulphonal has not yet been satisfactorily established, although notable contributions to this subject have been made within the current year.

(2) That sulphonal is chiefly *valuable as a hypnotic* in nervous insomnia, in some forms of insanity, notably in acute maniacal conditions, in acute sthenic febrile diseases, in the opium habit, in conditions of gastric irritability, at least temporarily in neurasthenia, and in some cases of anaemia. The effects of the remedy have been generally better, in the writer's experience, when the patients were strong and plethoric; and in these cases after-effects were most frequently entirely absent.

(3) That sulphonal is *contraindicated* because of its comparative uselessness in insomnia from pain, cough, cardiac dyspnoea, gastrectasia, chronic gastritis, and congestion of the stomach. The cause of its failure in the presence of pain, cough, and dyspnoea seems to be its slight narcotic action; and in gastrectasia, chronic gastritis, and gastric congestion, its slow absorption. It seems to be contraindicated on account of its possibly harmful effects in great physical prostration, in acute melancholia, and in insanity with depression, after labour, and perhaps in arterial fibro-sclerosis and angina pectoris.

(4) That significant *toxic symptoms* do not generally follow the use of sulphonal in adult cases unless 30 grains or more have been given at one dose, or in doses quickly succeeding each other. It must, however, be conceded that small doses do sometimes act unfavourably, owing to individual idiosyncrasies. The milder toxic symptoms from sulphonal are fatigue, depression, vertigo, *tinnitus aurium*, and nausea. The writer has also seen marked pallor and oedema beneath the eye-lids in several cases, just after the patients had waked from sleep

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caused by sulphonal. The graver toxic symptoms thus far reported are emesis, diarrhoea, partial aphasia, and ptosis, a cutaneous eruption like that of rubeola or of urticaria, brachycardia, incoördination, semi-coma, and collapse.

(5) That sulphonal is best *administered* by mouth, in hot beverages or in hot liquid foods, an hour or more before its effect is desired to begin, and that its use by rectum is not generally satisfactory.

In conclusion, the writer would urge the necessity of employing only pure sulphonal, as some bad results have doubtless come from the use of a spurious article. Alarm should not be felt because of the sensational statements of some authors who have used too large doses, or have employed sulphonal when it was contraindicated. The dose should be carefully adjusted to the requirements and peculiarities of each case; and since the effect of a full dose is often felt on the second or third night after its administration, it is well to decrease the dose on these nights, whenever the remedy must be given uninterruptedly for days or weeks.

The writer has not yet seen conclusive evidence that a sulphonal habit exists, nor has he observed any cachexia or dyscrasia which could be fairly attributed to the drug. He has obtained favourable results in about 80% of his cases, and has found that children take sulphonal readily, and tolerate it very well.

II. Amylene Hydrate.

This hypnotic was first studied by J. von Mering[1] (H. Thierfelder & J. v. Mering) in its action upon frogs, rabbits, and dogs. In frogs, to which from ⅛ gr. to 1½ gr. of amylene hydrate had been hypodermatically given, motor paralysis and loss of consciousness occurred, and were soon followed by full anaesthesia, and finally by loss of the reflexes. After a few hours the frogs gradually recovered. Rabbits fell into a deep sleep in from ten to twenty minutes after doses of

[1] Zeit. f. phys. chemie, 1885, vol. ix, p. 511, and Therap. Monatshefte, July, 1887.

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from 30 to 40 grs., and slept from six to eight hours. On awaking, these animals were quite at their ease, and soon began to eat. In the case of dogs which received corresponding doses, deep sleep occurred within thirty minutes, and the reflexes were almost entirely abolished. The sleep continued for eight or ten hours. The respiration was only slightly reduced. When the number of respirations was 20 at the beginning of the experiment, it only fell during the sleep to 16. After very large doses, death resulted from respiratory paralysis. On awaking, after small doses, the dogs were full of spirit and had a good appetite. The blood pressure was not reduced in dogs and rabbits, whether the drug had been given *per orem*, or subcutaneously, and the pulse was but little affected. Amylene hydrate, therefore, hardly affects the heart's action. LOEBISCH[1] calls attention to the similarity in the physical effects of ethyl alcohol and amylene hydrate. In moderate doses, both affect chiefly the cerebrum; in larger doses, the cord and medulla. The reflexes next disappear, respiration ceases, and cardiac paralysis closes the scene.

In von Mering's experiments with amylene hydrate in man, he obtained, in 350 trials upon 60 patients, quiet, restful sleep within half an hour after doses of from 45 to 75 grs. The sleep was not preceded by any period of excitement, and continued from five to twelve hours.[2] Amylene hydrate was, according to von Mering, particularly useful in nervous insomnia, and in sleeplessness due to excessive exertion, old age, anaemia, and phthisis, as well as in febrile diseases, as typhoid fever and rheumatism, in insanity and in *delirium tremens*. It was also useful in the whooping-cough of children, in doses of 3 grs. given at night. The drug is, however, uncertain in insomnia from pain, and von Mering advises that it be combined with morphia in such cases. He observed no bad sequelae, such as nausea, emesis, or headache. Von Mering considers amylene hydrate to stand midway between

[1] Die Neueren Arzneimittel, Wien and Leipzig, 1888, p. 71.
[2] Dr. B. Fischer, Die Neueren Arzneimittel, Berlin, 1889, p. 58.

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chloral and paraldehyde as regards its hypnotic powers. Fifteen grs. of chloral, 30 grs. of amylene hydrate, and 45 of paraldehyde are therapeutic equivalents. Chloral must still be used in cases requiring a very energetic hypnotic; but in ordinary cases amylene hydrate is preferred to chloral because it does not depress the heart, and because it affects the respiration but slightly. Amylene hydrate has a less disagreeable taste than paraldehyde, and the breath is not offensive after amylene hydrate has been taken, which is not the case with paraldehyde.

Dr. SCHARSCHMIDT[1] administered amylene hydrate to 80 patients, using 1,050 doses altogether. In 80% of these cases he obtained natural and sound sleep lasting from five to seven hours. Dr. Scharschmidt's patients suffered from insomnia incident to melancholia, dementia paralytica, primary and alcoholic dementia, mania, acute dementia, *delirium tremens*, and other psychoses. In *no* case did the hypnotic absolutely fail, as sleep could be induced by repeating the original dose, or by increasing it. The doses ranged from 20 to 45 grs. The remedy was given in red wine, with sugar, or disguised with extract of liquorice. No unpleasant after-effects were observed, except, rarely, a slight headache the following day. The appetite was not affected, the bowels remained open, and the normal rhythm of the respiration and of the circulation was undisturbed. Dr. Scharschmidt therefore recommends amylene hydrate for use in cases of insomnia with heart affections and with digestive diseases. He believes it to be superior to urethran because of its powerful action, and to paraldehyde on account of its less offensive odour and taste. As compared with chloral, paraldehyde, and urethran, Dr. Scharschmidt placed amylene hydrate next to chloral as regards efficiency. Sometimes it was even more effective than chloral.

Dr. LEHMANN[2] reported 26 cases of insanity treated with amylene hydrate. The drug was administered 149 times.

[1] Therap. Monatshefte, September, 1887; Centralbl. fur die gesammt. Therap., No. 12, 1887.

[2] Therap. Monatshefte, December, 1887.

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The doses varied from 15 to 75 grs., and on one occasion 90 grs. were given, in a case of mania. The remedy was given shaken up with water. The results were favourable in 88.2% of the cases. In chronic mania with hallucinations, and in paralysis of the insane, the best results were attained. In melancholia the hypnotic action was less marked. Sleep followed the administration of the drug in from five to fifteen minutes, and lasted from six to eight hours. The only bad effects were slight nausea and gastric distress on the day following the use of the remedy.

Dr. Lehmann considers amylene hydrate more efficient than paraldehyde, and less unpleasant since it does not taint the breath.

Dr. F. GÜRTTER,[1] of Königsburg, employed amylene hydrate in 61 cases of chronic alcoholism, epilepsy with nocturnal paroxysms, the opium habit, cerebral softening, gastric ulcer, tuberculosis, rheumatism, locomotor ataxia, cystitis, cerebral meningitis, and spasmodic cough. His average dose for adults was about 50 grs., for children under one year, 8 grs., and for older children, 9 grs. Gürtter's results were excellent, deep and natural sleep resulting and continuing all night in nearly all cases. In a few instances the sleep lasted only a few hours. The only unpleasant after effects were headache and slight oppression in a few cases, but in four cases symptoms resembling those of alcoholic intoxication were produced before sleep came on. The pulse and respiration were not affected by amylene hydrate even in cases of cardiac disease. The cough of phthisis was quieted and nocturnal epileptic paroxysms arrested by the drug. Dr. Gürtter prefers to administer amylene hydrate to children in gelatine capsules, and for adults recommends the following formulae:

(1) ℞ Amylene hydrate, 7 grammes.
Aq. destillat., 4 grammes.
Syr. rubi idaei, 30 grammes.
Sig. One half to be taken in the evening.

[1] Berlin Klin. Wooh., No. 6, Feb. 6, 1888.

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(2) ℞ Amylene hydrate, 7 grammes.
Aq. menth. pip., 40 grammes.
Syrup rubi idaei, 30 grammes.
Ol. menth. pip., 1 drop.
Sig. One half to be taken in the evening.

Dr. Gürtter prefers amylene hydrate to chloral, since it has no depressing action on the heart.

Dr. GEORGE ARELLIS[1] reported 40 cases treated with amylene hydrate in Prof. Riegel's clinic at Giessen, the number of individual trials being over 300. Among the patients treated were cases of gastric, nervous, and circulatory diseases, icterus, cholelithiasis, diabetes, tuberculosis, empyema, bronchitis, &c. The drug was given either in gelatine capsules, containing 15 grains each, or dissolved in water with claret, or raspberry syrup. The doses ranged from 12 to 50 grs. The average dose was from 31 to 37 grs. When the hypnotic could not be given by mouth it was administered by rectum, mixed with mucilage and distilled water. Given in this way it acted almost as quickly as when taken by the mouth. The mucous membrane of the bowel was not irritated by the amylene hydrate. The drug was generally given at eight or nine P. M. If a large dose was used, sleep usually followed in from five to eight minutes; if a smaller dose was administered, in from fifteen to forty-five minutes. The average duration of sleep was from six to eight hours. As a rule, the effect was excellent; and although the drug did fail in a few cases, it often would succeed with the same patients on the following evening. The conclusions reached by Dr. Arellis may be summarised as follows: (1) Amylene hydrate is a hypnotic whose action may be confidently relied on when sufficiently large doses are given. It is not so strong as chloral, but stronger than paraldehyde. (2) Amylene hydrate acts well with patients accustomed to other hypnotics, although they require large doses. (3) Sleep occurs soon after the administration of amylene hy-

[1] Deutsch Med. Woch., Jan. 5, 1888; Centralbl. f. Nervenheilk Leipzig, Feb., 1888.

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drate, and is not preceded by excitement. The sleep is light or deep, according to the dose, but the sleeper is always readily roused, and on waking is perfectly conscious and bright. If not too much disturbed, he will fall asleep again. (4) Sleep lasts from six to eight hours with large doses, and from two to three hours with small doses. (5) After the sleep patients feel refreshed and strengthened, and have no headache. (6) The respiration is unchanged. (7) The alteration in the pulse, rate and in arterial pressure is no more than is seen in natural sleep. (8) The patients have no bad taste in the mouth, nor disagreeable odour of the breath. (9) It is yet uncertain whether an amylene hydrate habit may be formed, but in no case was it necessary to augment the dose. One of Dr. Arellis's patients, a hysterical woman, became very loquacious after taking amylene hydrate, her face grew flushed, and the pulse was quickened. She remained awake for four hours. In three cases amylene hydrate failed. These were cases of erysipelas with delirium, of insanity, and of neuralgia, respectively. The desire to cough was lessened by amylene hydrate, even in phthisis, and the drug was particularly useful in the pruritus accompanying icterus. One patient maintained that he tasted the remedy in three minutes after it had been given by rectum. Dr. Arellis concludes that amylene hydrate should take precedence of chloral in diseases of the heart and of the circulatory system. The contraindications for amylene hydrate are unknown, but in gastric diseases it may be given by rectum.

Dr. A. L. MASON[1] employed amylene hydrate in several cases of insomnia with no bad effects, except that a mild intoxication occasionally occurred. It was more effective than paraldehyde or urethran, and in a case of typhoid fever it succeeded after morphia, chloral, the bromides, and urethran had failed. It rendered good service in cases of acute rheumatism, measles, acute tonsilitis, abortion, and chronic nephritis. Sleep was generally induced, in Dr. Mason's cases, within twenty minutes.

[1] Boston Med. and Surg. Jour., Feb. 16, 1888, p. 176; Therap. Gazette, April 16, 1888.

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Dr. FRANCIS H. WILLIAMS[1] reported some cases of insomnia treated with amylene hydrate. In one uterine case, ½ gr. of morphia several times repeated had failed to produce sleep, which, however, ensued within fifteen minutes after 40 grs. of amylene hydrate were given. Dr. Williams believed that this hypnotic was destined to supplant chloral in certain cases, and observed no bad after-effects, except slight intoxication lasting a few hours.

Dr. DIETZ[2] reported the only notably unfavourable results which the writer has seen mentioned in medical literature, and these, apparently, were due to over-doses unintentionally given on account of accumulation of the amylene hydrate at the top of the bottle. These results impel Dr. Dietz to recommend that, owing to the light specific gravity of amylene hydrate, which prevents it from readily mixing with various menstrua, the mixtures be well shaken before being used. The bad results above referred to were observed in the cases of four patients to whom the hypnotic was given after the bottle had stood at rest for a few minutes. All of these patients, who had been very restless before, slept all night, and could not be aroused on the following morning. Their extremities were paralysed. There was loss of sensibility, and the reflexes, even the corneal, entirely absent. The pupils were widely dilated, and responded but slowly to light. The temperature was 95° F., the pulse slow and feeble, and the respiration slow, irregular, and superficial. At midday two of the patients became a little restless, but if raised in bed, quickly fell back again and went to sleep. The patients also slept through the second night, and only returned to their natural state the next day. Dr. Dietz thinks, from the quantitative analysis of the amylene hydrate remaining in the bottle, that the doses were not very large, but advises the careful mixing of the medicine, or its administration in capsules.

Dr. BASCHAN[3] used amylene hydrate 209 times in eleven

[1] Jour. Am. Med. Asso., Feb. 25, 1888, p. 176.
[2] Deutsch. Med.-Zeit., March 1, 1888.
[3] Berlin Klin. Woch., March 19, 1888.

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cases of insanity. His experience shows this to be a hypnotic of the first rank, and to be an excellent *succedaneum* to chloral and paraldehyde. Over these drugs it has the advantage of not affecting the heart or of tainting the breath. Dr. Baschan's results were as follows: Good sleep in nearly 80% of his cases; tolerable sleep in 12%; no sleep in 8%.

Dr. J. P. CROZER GRIFFITH,[1] of Philadelphia, with Dr. ELWOOD KIRBY, reported excellent results obtained with amylene hydrate in eighty-five trials on eighteen patients. In one case of opium habit, in which chloral, bromides, paraldehyde, and hyoscine, singly and combined, had produced poor results, amylene hydrate induced perfect sleep. A case of violent alcoholic delirium was put to sleep in ten minutes by 20 minims of amylene hydrate, although it failed in the same case on another occasion. It is less successful when there is pain or cough. The bad taste may be covered with liquorice. Amylene hydrate is more powerful than paraldehyde or urethran, and preferable to them. In heart diseases it should always be chosen instead of chloral, although it is weaker than the latter. Griffith considers amylene hydrate equal to sulphonal, and superior to it in some respects, as it acts more quickly, and does not produce giddiness and somnolence the next day. Griffith recommends the use of amylene hydrate in capsules.

Dr. LARES[2] used amylene hydrate 340 times in fifty cases. He gave it by rectum chiefly. The normal dose for men is 45 grs. by mouth, or from 45 to 75 grs. by rectum. It acted well in Lares's cases of febrile insomnia, acute bronchitis, phthisis with harassing cough, acute alcoholism, and neurasthenic insomnia. Cardiac dyspnoea was not favourably affected by amylene hydrate. Lares considers amylene hydrate an excellent hypnotic, which may be given in doses two or three times as large as chloral, although not quite as certain as this, or as opium. Lares met with no serious after-effects, and only seldom saw excitement or stupor. The

[1] Med. News, May 19, 1888, p. 546, and Sajon's Annual of the Univ. Med. Sci., 1889, vol. v, p. 17.

[2] Berlin Klin. Woch., May 21, 1888.

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drug, although given in some instances for three consecutive months, never lost its power. The patients praised the effect of amylene hydrate more highly than that of any other hypnotic.

Dr. G. MAYER[1] made several hundred trials of this drug, in fifteen cases, and decided that it is reliable and pleasant, except in so far as its taste is concerned. He praised its efficacy in respiratory diseases, in which it not only induced sleep, but quieted the cough.

Mr. CONOLLY NORMAN[2] objects to amylene hydrate on the ground that it is uncertain and dangerous, basing this view upon a case reported by Schlös,[3] and on the facts that it has a bad taste and smell, and upsets the stomach.

The writer has employed amylene hydrate in thirty-eight cases of insomnia from various diseases, attaining success in 76% of the cases. Upon the basis of his own experience, and that of the authorities he has quoted, he reaches the following conclusions:

(1) The *physiological action* of amylene hydrate is similar to that of alcohol. In therapeutic doses it produces sleep by its soporific action on the cerebrum. In toxic doses it paralyses the cord and medulla, finally abolishing the reflexes, arresting the respiration, and paralysing the heart.

(2) It is *applicable, therapeutically*, to insomnia from nervousness, from excessive mental and physical exertion, from anaemia, fevers, insanity, particularly from *dementia paralytica*, from acute alcoholism, cardiac disease, the opium habit, and from the withdrawal of hypnotics which have been constantly employed.

(3) It is *contraindicated*, because not efficacious, in insomnia from pain, cough, and often from cardiac and uraemic dyspnoea. Its use by mouth is contraindicated in gastric diseases attended with irritation or inflammation, because of its slightly irritating character; but it may be given by rectum in such cases. Amylene hydrate should not be given to

[1] Therap. Monatshefte, July, 1888.
[2] Dublin Jour. of Med. Sci., Jan., 1889, p. 19.
[3] Jahrb. d. Psych. viii, 122.

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fastidious patients, on account of its taste and odour; and children generally object to it.

(4) The *toxic effects* from therapeutic doses of amylene hydrate are generally unimportant, consisting of headache, slight nausea, gastric distress, thoracic oppression, perhaps from gastric tympanites, and slight intoxication, like that of alcohol. Dietz's experience seems, however, to show that much more serious symptoms may sometimes follow moderately toxic doses, viz., loss of reflexes, paralysis of the extremities, mydriasis, low temperature, feeble pulse, and slow, superficial respiration. It is possible that some medicament other than amylene hydrate was given to Dietz's patients by the attendants.

(5) Amylene hydrate is *best given by mouth* in soft capsules, or in a mixture or solution disguised by peppermint-water, raspberry syrup, or extract of liquorice. The mixture should be thoroughly shaken before it is used, in order to avoid the administration of an over-dose. The remedy may also be given by rectum. The writer's doses for adults are, by mouth, from 30 to 45 grs., and by rectum from 45 to 75 grs.

(6) The writer has not seen any cases in which an amylene hydrate *habit* had been engendered, or a cachexia due to the remedy had been developed.

III. Paraldehyde.

Paraldehyde was first recommended as a hypnotic by Dr. Cervello,[1] his object being to substitute for chloral a hypnotic devoid of the latter's harmful effect upon the heart. Cervello's experiments showed that paraldehyde produces, both in cold and in warm blooded animals, complete anaesthesia and deep sleep, without much diminishing the respiration. In toxic doses, however, death resulted from paralysis of the respiration. Reflex action is only arrested by lethal doses, from which fact it may be concluded that paraldehyde in moderate doses acts like ethyl alcohol, affecting, first, the

[1] Ueb. d. phys. Wirk. des P. Archiv. f. exper. Pathol. u. Pharmak., B. xvi, p. 265, 1882.

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cerebrum, in larger doses, the cord and the reflexes, and, finally, arrests the respiration by paralysing the medulla.

The hypnotic action of paraldehyde shows a great similarity to that of chloral. Paraldehyde, however, according to Cervello, reduces the frequency of the respiration much less than chloral, and it has no harmful action upon the heart. Even in the most profound narcosis, it hardly reduces the arterial pressure. Cervello's experiments on men and women showed that in women 15 grs. sometimes acted as a sedative, while strong men sometimes did not sleep after taking even 60 grains. One hundred and fifty grs. can be given to adults, in divided doses, without any bad effects. The drug is rapidly absorbed from the gastro-intestinal canal, but more slowly from the rectum. Given subcutaneously, paraldehyde produced violent pain at the point of injection, but no inflammatory trouble, and even in small doses acted as an efficient hypnotic. When inhaled, paraldehyde first excites, and then acts as a soporific; but this mode of administration is not to be recommended on account of the long time required for anaesthesia, and because the vapour of paraldehyde is very irritating. Upon the basis of his experiments, Cervello recommended paraldehyde as a hypnotic, since it produced quiet sleep, simulating natural slumber, and did not cause evil after-effects.

According to Dr. HENOCQUE,[1] oxyhaemoglobin is reduced by paraldehyde, which explains the fact that during the use of it the excretion of CO_2 by the lungs is diminished more than one half, although the frequency of respiration is not appreciably affected.

Drs. A. BÓKAI and L. BARESE[2] found that paraldehyde produces excitement, like chloroform, before its hypnotic action appears. The reflexes are particularly stimulated at first. According to Barese, paraldehyde, given in any way, paralyses the vaso-motor centre, like amyl-nitrite. It also produces myosis, which must be central, because it could not

[1] Loebisch, Die Neu. Arzneimittel, Wien. u. Leipzig, 1888, p. 52.

[2] Paraldehyde, Chloralhydrat, u. Metaldehyd, Pest. Med.-Chi. Presse, 1885, 37, 38, 44; 1886, 25, 26.

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otherwise be removed by physostigmine. Paraldehyde produces abundant alvine evacuations by stimulating peristalsis, and Barese therefore recommends it for lead colic. After long use, paraldehyde caused death of rabbits by fatty degeneration of the liver.

Dr. E. MOISELLI, of Turin,[1] made the first clinical tests of the new hypnotic in the Turin Insane Asylum. Among his patients were cases of mania, insanity with hallucinations, hysteria, epilepsy, acute melancholia, and other diseases. Some of the patients were suffering from organic heart disease. Paraldehyde was most efficient in mania, delirium tremens, and in the excitement inaugurating dementia. From 45 to 90 grs. sufficed, as a rule, to cause four or five hours' sleep. During sleep the reflexes were diminished, and the pulse reduced from eight to fifteen beats per minute, but remained regular and strong. Even in cases of mitral insufficiency, there was no diminution of pressure after its administration. Loebisch[2] states that in some cases other observers have noticed a slight depression of the heart's action, and a tendency to dicrotism after the use of paraldehyde. The respiration became less frequent and deeper, while the urine was augmented in quantity, but did not contain paraldehyde. Only two or three times, out of 350 cases, was nausea observed, and emesis only once, in the case of an hysterical woman.

Dr. J. PERETTI[3] noted constant enuresis in cases which did not present this symptom until paraldehyde was administered.

Dr. LANGREUTER[4] observed moderate cerebral congestion, vertigo, heaviness in the legs, and stiffness of the neck before the sleep resulting from paraldehyde.

According to Dr. C. V. NOORDEN,[5] paraldehyde is contraindicated in gastric ulcer and in advanced phthisis with laryngeal ulceration. In the latter class of cases it occasions

[1] Enrico Moiselli, P. als. Hyp. u. Sed. bei Geisteskranken, Irrenfreund, 1883, 3.
[2] Loc. cit.
[3] Berlin Klin. Woch., 1883, 40.
[4] Centralbl. f. Nervenkrank., 1883, 15.
[5] Centralbl. f. Klin. Med., 1884, 12.

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cough, emesis, and excitement. In the presence of pain, the effect of paraldehyde is less marked than that of opium, and even less than that of chloral.

Dr. RANKE[1] reported that many of his patients, to whom a single dose of 90 grs. had been given, suffered from violent headache which lasted all night, and that some patients were nauseated by the remedy and vomited.

Dr. E. KONRAD[2] regards the maximum dose of paraldehyde for insane patients to be from 150 to 180 grs.; from 90 to 120 grs. constituting a medium, and from 45 to 60 grs. small doses. The average hypnotic dose for other patients ranges from 45 to 90 grs.

Mr. G. F. HODGSON[3] reported his experience with paraldehyde after having used 2 qts. of it in practice. He found it of great hypnotic value, producing natural sleep promptly and without after-effects. He recommended it for the insomnia of gout, mania, hypochondriasis, delirium tremens, migraine, and of general diseases.

Dr. DUJARDIN BEAUMETZ,[4] in a lecture on therapeutics, said that in his experience the sleep of paraldehyde was analogous to that of chloral. It is usually calm, but sometimes preceded by excitement. It does not, according to Hayem, produce methaemoglobin in the blood. It is eliminated chiefly by the breath, but partly in the sweat if large doses have been given. Compared with chloral, it has these advantages: It is better borne by the stomach; it is a better antidote to strychnia, but is less analgesic; it is better in alcoholic insomnia and in that of insanity; it is valuable in cerebral affections, epilepsy, hysteria, and morphiomania; it does not lose its effect from long use.

Drs. CAPELLI and BUGIA[5] made some experiments with paraldehyde which showed that 45 grs. increased the cardiac power in healthy persons, and that this augmented power

[1] Württemberg, Corr. Bl., 1884, 20.
[2] Oroosl. Hetelap., 1884, 37.
[3] Amer. Jour. Med. Sci., Jan., 1886. p. 265.
[4] Bull. Général de Therap., Oct. 30, 1885; Amer. Jour. Med. Sci., Jan., 1886, p. 265.
[5] Archiv. per le malat. nervos, 1886, i.

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was at its maximum during the deepest sleep. If no sleep ensued, this effect on the heart was less marked. In the peripheral arteries a gradual diminution of pressure occurs, as with chloral, and the same is true to a less extent of the cerebral vessels.

Prof. BAKAI[1] tested paraldehyde as an antidote to strychnia, in rabbits, cats, and dogs, with almost invariably favourable results. The animals were first given a non-toxic dose of paraldehyde, and then a fatal dose of strychnia. In no case did the strychnia produce death. The antagonism between these drugs is not reciprocal, however, because after the administration of fatal doses of paraldehyde the largest doses of strychnia failed to preserve life. Prof. Bakai strangely failed to apply the crucial test of paraldehyde's *prophylactic* virtues by first giving a toxic dose of strychnia and following it by a dose of paraldehyde.

Dr. v. KRAFFT EBRIG[2] characterised paraldehyde as one of the most valuable of our recent therapeutical acquisitions, especially in neurasthenia, hysteria, and chronic nervous diseases, when idiosyncasies exist as regards other hypnotics. As long as one gives moderate doses, paraldehyde can, according to Dr. v. Krafft Ebrig, be given for a long time without injury to the organism. In substantiation of this assertion, Dr. v. Krafft Ebrig cites a series of cases in which for over two years almost nightly doses of from 60 to 90 grs. of paraldehyde were taken without injury. In one obstinate case the patient took 180 grs. daily for months, without bad results. In a case of delirium tremens 300 grs. were given in twenty-four hours without bad effects, and with the final result of producing sleep and a cure. If, however, *over-doses* of paraldehyde are given for a long time, the organism is seriously injured. Thus, Dr. v. Krafft Ebrig reports the case of one patient who, under other medical advice, had taken 525 grs. daily for a year. This patient complained of tremor of the hands, loss of memory, and mental hebetude. He was

[1] Pharm. Post., April 24, 1886; Therap. Gazette, July, 1886, p. 468.
[2] Zeitsch. f. Therap., 1887, No. 7.

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pale, oedematous, anaemic, fleshy, and asthenic, and presented the aspect of a chemically intoxicated person on the verge of acute alcoholism. In another of Dr. v. Krafft Ebrig's cases, the reduction of the habitual dose of paraldehyde led to delirium. The patient in question was a lady of twenty-seven years, who had been cured of the chloral habit by enormous doses of paraldehyde. After using it for a year, she had increased the dose up to from 450 to 600 grs. *per diem*. She was then suffering from anaemia, oedema, violent tremor of the hands and tongue, congestion of the head, *globus hystericus*, with constriction in the chest. She continually exhaled the paraldehyde in her breath, which was thus very offensive. The dose having been reduced to 150 grs. daily, delirium manifested itself, and lasted a week before it could be controlled with opium.

Dr. CHAS. G. STEELE,[1] of Buffalo, published an exhaustive paper on paraldehyde, in which, after considering the physiology, the toxicology, the administration, and the therapeutics of the drug, and presenting the history of some interesting cases, he formulated the following conclusions: (1) Paraldehyde is a pure hypnotic, and *not* an anodyne; (2) it is safer than any other hypnotic, save, perhaps, the bromides; (3) it must not be used indiscriminately in the place of chloral. There are only certain cases in which it is indicated in which chloral is contraindicated. (4) It is going to serve a grand purpose in cases of insomnia and in cerebro-spinal disturbance, where the circulation is weakened and a nervous sedative is required; (5) it is an excellent substitute for chloral, the bromides, and valerian in delirium tremens and acute alcoholism; (6) it may prove of great service as an antidote to strychnia.

Dr. TCHEPETOW[2] obtained good results with paraldehyde in delirium and in the excitement of insanity, and in phthisis induced quiet sleep with 3 grms. (grs. 46.6) of the drug.

Dr. A. B. COOK[3] recommends paraldehyde in the form of

[1] Med. Press of West. N. Y., Oct., 1887, p. 443.
[2] Wratsch, St. Petersburg, No. 49, 1887.
[3] Med. Prog., Jan., 1888.

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the elixir, claiming that it is palatable and non-irritating to the stomach. He found it not only a good, simple hypnotic, but useful in asthma, puerperal convulsions, and cough. He considers it possessed of anodyne virtues.

Dr. G. R. BUTLER[1] found paraldehyde valuable as a simple hypnotic, but useless in the presence of pain or of cough.

Dr. E. R. SQUIBB[2] stated that, although paraldehyde had not sustained its earlier promise, it was useful as an alternate hypnotic. It has a stage of excitement, but this is very slight and short with full doses, and is not a disadvantage. It is safer for the heart than chloral, but its greatest drawback is its disagreeable character. It has not been shown to be effectual when chloral has failed, but, rather, when chloral is contraindicated.

Dr. U. B. LA MOURE[3] recommended paraldehyde for the obstinate vomiting of gastritis, ovarian irritability, pregnancy, and migraine. He gave, for this purpose, 40 drops of paraldehyde to an ounce of simple elixir, of which one drachm is given in water, and repeated in one half hour if required.

Dr. KENISTON[4] considers paraldehyde quicker than chloral, and devoid of unpleasant sequelae. It is an excellent hypnotic in restlessness and excitement without pain, and is as safe as the bromides.

Mr. H. D. ROLLESTON[5] reported a case tending to show that paraldehyde is not devoid of danger in cases where the respiratory centre is depressed and some cyanosis is already present. The patient in question had advanced emphysema, and slight bronchitis and dilatation of the right heart. There was cyanosis of the face, neck, and chest, but no cardiac murmur. The respirations were sixty per minute. Being sleepless, the patient received 60 grs. of paraldehyde. In an hour she became collapsed, and suffered from dyspnoea. The respirations numbered eighty to the minute, and her pulse-

[1] Brooklyn Med. Jour., May, 1888, p. 874.
[2] Ephemeris, June, 1888, p. 1078.
[3] Albany Med. Annals, June, 1888, p. 172.
[4] New England Med. Monthly, July 15, 1888.
[5] Practitioner, Nov., 1888; Therap. Gazette, Jan., 1889, p. 84.

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beats 156. She was sleepy, but delirious. Ether having been given and poultices applied, she grew better, and in two hours was herself again. The same results attended the administration of the same amount of paraldehyde to the same patient two weeks later.

Dr. P. W. MACDONALD[1] said that in his experience the action of paraldehyde is gradual, and even if it fails to produce sleep it does not excite. Its use is not followed by headache or by gastric disturbance, but it is exhaled for many hours in the breath. This fact Dr. MacDonald regards as a safeguard against the clandestine use of the drug, rather than as an objection. There is no cumulative action of paraldehyde, and Dr. MacDonald has not met with a case of tolerance. It is a very valuable hypnotic, and can be given with safety, no matter how abnormal the heart's action or other bodily functions may be. Paraldehyde is indicated in all cases of insomnia, except that due to acute mental excitement and to severe pain. Dr. MacDonald particularly recommended paraldehyde in the insomnia of (1) simple mania and melancholia, (2) nervousness and hysteria, (3) great grief or mental anxiety, (4) over-work or exhaustion.

Mr. CONOLLY NORMAN,[2] in comparing paraldehyde with sulphonal, says that paraldehyde's greatest disadvantage is the necessity of constantly increasing the dose, which is not true of sulphonal. Norman also states, on the authority of Fröhner, that paraldehyde causes destructive changes in the blood corpuscles.

Dr. T. S. CLOUSTON, of Edinburgh,[3] related his experience in the use of paraldehyde. He had employed it largely for two years, and liked it better than any other pure hypnotic. Often the patient is asleep in five minutes after it is given. Among one hundred cases, it caused sickness in only two, general *malaise* being produced in one, and headache in the other. It does not derange the bowels or disturb the appetite. The first part of the sleep produced by paraldehyde is,

[1] Bristol Med.-Chir. Jour., Dec., 1888, p. 259.
[2] Dublin Jour. of Med. Sci., January, 1889; Am. Jour. Med. Sci., March, 1889, p. 278.
[3] Am. Jour. Med. Sci., April, 1889, p. 350.

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according to Dr. Clouston, a drug sleep, and the rest of it is natural. In certain cases it restores the habit of sleep in from one to six weeks, and may then be discontinued without leaving a habit and without a return of the original insomnia. It is not only useless, but really harmful when given in the daytime. The dose varies greatly with the case. Too small doses may excite. Dr. Clouston's initial dose is 40 to 60 minims, and his maximum dose generally two drachms. Three or four drachms may be needed in chronic insomnia, melancholia, and acute mania. To one patient he gave four drachms every night for two weeks. Its bad taste cannot be hidden, and the breath of the patient smells of it for twenty-four hours after a dose is taken. The toxic dose is not yet determined. One patient took an ounce at one dose, and slept stertorously for twelve hours, but the reflexes and the heart were not affected, and the patient recovered. In mania, Dr. Clouston often adds 60 grs. of a bromide. He believes that he has never injured a patient, nor retarded his recovery, even by a prolonged use of paraldehyde. Dr. Clouston concludes that, for the insomnia of mental diseases, "paraldehyde is the purest and least harmful hypnotic yet introduced, when the insomnia is marked and intractable." Urethran and sulphonal cannot compare with it. Opium and chloral have special dangers and disadvantages from which paraldehyde is free.

Dr. JOHN GORDON[1] published the results of very careful experimental studies of paraldehyde's action, which are as follows: (1) Paraldehyde increased the secretion of urea. (2) It did not affect the amount of chlorides given off. (3) In the majority of cases it diminished the fluid constituents of the urine. (4) The odour of it given in large doses appeared in the urine, showing that the drug probably passed through the system unchanged. (5) After a full dose of it the respirations were slowed, and made steady and tranquil. (6) It had no noticeable effect on the temperature. (7) In health, if insomnia was not present, it had no hypnotic effect, except

[1] Brit. Med. Jour., March 9, 1889.

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in large doses. (8) It caused no loss of appetite. (9) It sometimes caused sweating, which was controlled by atropia. (10) The blood pressure was but slightly reduced by small doses. Larger doses reduced it more, but only after distinctly slowing the respiration. (11) The pulse was retarded. (12) The reflex irritability of the spinal cord was diminished. (13) It produced peripheral anaesthesia. (14) It quickly diminished, and, in larger doses, destroyed motor irritability. (15) Equal doses diminished the excitability of motor nerves sooner than that of muscle. (16) Small doses first slightly excited and then diminished muscular excitability. (17) The muscles recovered their irritability after small doses, but rarely after larger ones. (18) Curarised muscle showed increase of excitability over non-curarised muscle, when treated with an equal dose of paraldehyde, and equally stimulated. The advantages of it, as a hypnotic, are as follows: (1) It does not depress the heart. (2) It does not need to be given in increasing doses, even when taken for months. (3) No craving for it seems to be induced by its long use. (4) Except in large doses, it does not produce sleep in persons not suffering from insomnia: hence there is no probability of its abuse. (5) It has no marked period of excitement before the hypnotic stage is reached. (6) It acts quickly, generally in ten minutes. (7) Patients under its influence may be aroused without feeling any unpleasant effects. (8) The sleep it induces is tranquil and attended by slowed respiration, which is an advantage in many pulmonary diseases. (9) It is not liable to disorder digestion. (10) In many instances it is gently laxative. Dr. Gordon prescribes from 40 to 60 minims for adults, well diluted with cinnamon-water, syrup of tolu, and comp. tincture of cardamons. Dr. Gordon's experiments with frogs show that it somewhat diminishes sensibility, and it is therefore possible that it exerts a narcotic influence on the sensory pulmonary nerves.

Dr. C. M. HAY[1] reported the results of his carefully con-

[1] Am. Jour. Med. Sci., July, 1889.

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ducted experiments with reference to ascertaining the comparative hypnotic merits of paraldehyde and sulphonal. The results, as regards sulphonal, have been given under that caption. Dr. Hay's elaborate experiments occupied six months, beginning November 1, 1888. It was used in 100 cases of insanity, and in 20 cases of primary diseases other than insanity. All precautions were taken to secure accuracy in the results of the observations. Dr. Hay's standard of success was as follows: From six to nine hours' sleep was counted a successful trial, from three to five hours a partial success, and under three hours a failure. The doses varied from one to two and a half drachms. The number of trials made in the 100 cases of insanity were 3,515. Of these, 2,407, or 68.5%, were successful; 711, or 20%, partially successful; and 397, or 11.3%, failures. These 100 trials showed it to be most valuable in the insomnia of dementia, of least service in acute mania, and that it is of nearly equal value in acute and chronic melancholia and epileptic dementia; also, that it was less effective in the insomnia of maniacal states than in melancholic conditions, for only 57% of the trials in chronic mania were successful. In periodical mania it failed in only 12.8%, while in acute mania it failed in 25.5% of all the cases. In Dr. Hay's 20 cases of various diseases other than insanity, it was given 267 times, with success in 50.9%, partial success in 19%, and failure in 30.1% of the trials. These cases were as follows: Phthisis, 2; erysipelas, 6; acute rheumatism, 3; pneumonia, 3; cerebral gumma, 1; typhoid fever, 1; painful leg ulcer, 2; cellulitis of the arm, 1.

Dr. Hay concludes,—(1) That paraldehyde is safer than sulphonal when continuous administration is required; (2) that it has a wider range of application in mental diseases than sulphonal; and (3) that, in the sleeplessness of acute and chronic diseases, where pain, cough, dyspnoea, or fever exists, sulphonal is less effective than paraldehyde.

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The writer has recently used paraldehyde in 35 adult cases of insomnia from varied causes, for the purpose of comparing its effects with those of other hypnotics. His doses varied from 60 to 90 minims. Successful results were attained in 72 % of the cases. The writer's inferences, drawn from his own studies and from medical literature bearing upon this subject, are as follows:

(1) Paraldehyde, in moderate therapeutic doses, acts like ethyl alcohol, producing sleep by its hypnotic action on the cerebrum. This sleep is, however, preceded by a brief period of excitement, during which the reflexes are augmented. In larger doses, it paralyses the spinal cord and abolishes the reflexes, finally arresting respiration by paralysing the medulla. It also exerts a paralysing action on the vaso-motor centres, like amyl-nitrite, according to Dr. Bókai. It causes central myosis, and stimulates intestinal peristalsis. In full doses, it slows and tranquillises the respiration. It does not notably affect the temperature, but sometimes causes slight diaphoresis. The blood pressure is slightly reduced by small doses, and more decidedly by larger ones. The pulse is somewhat slowed. It does not markedly irritate the stomach. It is not yet decided whether it produces methaemoglobinaemia.

(2) Paraldehyde is indicated in the insomnia of acute and chronic melancholia, of epileptic dementia, of acute alcoholism, of the opium habit, of hypochondriasis, hysteria, neurasthenia, chronic gout, exhaustion from overwork, and the dyspnoea and cough of pulmonary and cardiac diseases. It has also been recommended as an antidote to strychnia.

(3) It is contraindicated in cases of cyanosis with depression of the respiratory centre, as in advanced emphysema with bronchitis and cardiac dilatation, in painful diseases, gastric ulcer and gastritis, in pharyngeal or laryngeal ulceration, and is to be used cautiously in anaemia, as it *may* reduce the oxyhaemoglobin of the blood.

(4) The milder toxic effects of it are headache, which is not very common, nausea and vomiting, which are rare, ver

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tigo and slight cerebral congestion. In powerfully toxic doses, it first produces deep sleep with anaesthesia, then abolition of the reflexes, and death from paralysis of the respiratory centre. It may be given a long time in moderate yet effective doses with no harmful results, as is shown by von Krafft Ebrig's case of two years' standing. If, however, the large doses are given for a long time, tremor of the hands, anaemia, oedema, delirium, and a condition resembling chronic alcoholism may be developed. In rabbits poisoned by the long continued use of relatively large quantities of paraldehyde, fatty degeneration of the liver is produced.

(5) It is best given in soft capsules, or disguised with cinnamon-water and compound tincture of cardamon. The average adult dose is 60 minims. It should not be given hypodermatically, on account of the local pain and irritation which it produces, nor can it be given by inhalation, as it then acts too slowly and is too irritating.

It does not seem to have a cumulative effect. No tolerance of it is established, nor is an appetite generally engendered by its long employment.

IV. Urethran.

Prof. O. Schmiedeberg, of the University of Strassburg, in a paper entitled "On the Pharmacological Action and the Therapeutic Application of Some Ethereal Salts of Carbamic Acid."[1] first proposed urethran as a possible hypnotic, basing his expectations regarding its hypnotic action upon its chemical composition, and predicting that urethran would be found to be applicable to those cases in which chloral's action on the heart, vessels, and respiration must be avoided, and those in which the odour and taste of paraldehyde were objectionable. Prof. Schmiedeberg noticed, in frogs, birds, and mammals, after moderate doses of urethran, diminished functional activity of the cerebrum, with no secondary effects. Voluntary movements were diminished and sensibility lessened. In rabbits and pigeons a peculiar rigid immo-

[1] Archiv. f. Experiment Patholog. and Pharm., 1885, xx, 210.

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bility occurred. After larger doses, voluntary movements were farther diminished, and insensibility and unconsciousness followed, very much as they occur in profound narcosis from chloral or from chloroform. The respirations, however, were increased in depth and frequency. This effect on the respiration is due to a direct stimulation of the respiratory centres, since these centres are cut off by the earlier effects of the drug from the action of peripheral stimulation, and since the circulation is not affected. This stimulating action of it on the respiratory centres is, indeed, so marked, that it is possible in rabbits to strengthen and hasten the respiratory efforts when these have been made superficial and slow by chloral. Even in deep urethran narcosis, the heart beats strongly and the blood pressure remains at the normal height. Emesis follows large doses in dogs. In accordance with these results Prof. Schmiedeberg recommended the induction of the earlier physiological effects of urethran, *i. e.*, the obstunding of the general sensibility for hypnotic purposes in cases where there exists the need of rest and sleep, which are prevented by cerebral excitement.

Dr. H. HUCHARD,[1] in experimenting on rabbits with urethran, found, after very large doses, reduction of the temperature and of motility, but no disturbance of sensation. In Guinea-pigs, he observed, after they awoke from urethran sleep, increased secretion of the saliva and hyperaesthesia of short duration.

Dr. R. VON JAKSCH[2] first made clinical tests of urethran at Nothnagel's clinic, using it 110 times in twenty cases of various diseases, and reported that, in appropriate cases, it is a sure hypnotic in doses of 15 grs., producing quiet sleep without bad secondary effects. It works, according to von Jaksch, chiefly upon the brain, without affecting the peripheral sensory nerves, and is hence ineffectual in the cough of phthisis and in neuralgias. Von Jaksch strongly recommended urethran as a certain and safe hypnotic for children.

[1] Bull. Général de Thérap., 1886, Pamphlets 3 and 4.

[2] Wien. Med. Blätt., 1885, 33 and 34; Abstract in Brit. Med. Jour., 1885, vol. ii, p. 611; Loebisch, Die N. Arzneimittel, 1888, p. 63 et seq.

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Dr. GEORG STICKER[1] reported favourably on urethran, recommending it only for those cases in which insomnia depends upon morbidly increased sensibility of the cerebrum to external and internal irritation, when the need for sleep is felt but its inauguration prevented by cerebral over-action. The hypnotic effect is more easily obtained in the quiet evening hours than in the daylight or in the presence of disturbing noises. The reflex movements are little affected during the urethran sleep. The pupils react well. In general, the sleep is similar to normal slumber, and is not followed by heaviness or other evil sequelae. In some of Sticker's cases profuse perspiration occurred during the sleep. Sticker observed, in one quarter of all his cases, within twelve hours after the administration of urethran, an increase of the urine to double the quantity which was evacuated before the exhibition of the remedy. Sticker used doses of 15 grs. at first, but gradually increased them to 30, 45, and even 60 grs. in suitable cases. Still, he noticed that small doses, as of 15 grs., repeated every half hour or every hour, produced better results than a large, undivided dose. This was confirmed by Dr. C. Hübner.[2] After doses of from 30 to 60 grs. the respiration became more rapid and deep, and the arterial tension rose, while the pulse became less rapid. In one case of leucaemia, Sticker saw emesis follow a dose of 45 grs. The appetite was not affected by the long continued use of small doses, but was impaired by larger doses.

Dr. A. S. MYRTLE,[3] of Harrowgate, England, used urethran in over fifty cases, with excellent results.

Dr. T. LANG[4] reported favourable results from urethran in a long series of cases. Among his male patients he saw no unpleasant after-effects. One neurasthenic woman complained, immediately after waking, of a heavy feeling in her head, and was somnolent for some time.

[1] Deutsch. Med. Woch., 1885, p. 48; Deutsch. Med. Zeitsch., January, 1886.
[2] Dr. W. F. Loebisch, Die N. Arzneimittel, 1888, p. 65.
[3] Brit. Med. Jour., Feb., 1886.
[4] Wien. Med. Presse, 1886, 6.

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Dr. HANS ROTTENBILLER[1] reported his experience with urethran. He used it 240 times in fourteen cases, all of them insane patients. He began with 7½ grs., but this dose was inadequate. With from 7½ to 15 grs. he obtained, for a few days, four hours' sleep, and later only one or two hours' sleep. With from 30 to 60 grs. he produced quiet sleep, lasting from six to eight hours, in eight patients, but in four others only from two to four hours' sleep. In a case of mania with hallucinations urethran failed, but paraldehyde succeeded. Rottenbiller's patients went to sleep in from fifteen to thirty minutes after having the remedy. There were no after-effects, except emesis in one case and gastric disturbances from large doses. In nine cases Dr. Rottenbiller used the urethran hypodermatically on account of its high price, giving 4 grs. for each dose. From this quantity, once repeated, he obtained from six to eight hours' sleep. The injections caused no pain and no abscesses.

Dr. WM. THOS. JACKMAN[2] reported a case of traumatic tetanus, treated at first with chloral, without complete recovery, which, however, ensued under the urethran treatment alone.

Dr. E. KRAEPELIN[3] reported 200 cases, mostly of insanity, treated, in the main successfully, with urethran. He considers it a simple hypnotic, of comparatively feeble powers, and of little use in great excitement. It was chiefly effective in melancholia and general paresis. In the excited stages of paresis, however, and in mania and delirium tremens, he was obliged to use paraldehyde. In insomnia from pain, it also failed completely. Kraepelin recommends doses of from 30 to 45 grs. Doses of 15 grs. were successful in 54% of the cases, and doses of 45 grs. in 70%. After doses of 60, 90, and 120 grs., emesis ensued.

Drs R. OTTO and W. KÖNIG[4] tried urethran 250 times in

[1] Centralbl. f Nervenheilk., No. 10, May 15, 1886; Therap. Gazette, July, 1886, p. 474; Amer. Jour. Med. Sci., Jan., 1887, p. 294.
[2] London Lancet, vol. i, 1886, p. 1112.
[3] Neurolog. Centralbl., No. 5, March 1, 1886, p. 108; Brit. Med. Jour., vol. ii, 1886, p. 268.
[4] Therap. Gaz., July, 1886, p. 478; Centralbl. f. Nervenk., 1886.

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twenty-three cases of insanity, with general good results. These cases were chiefly violent epileptic, hysterical, and idiotic ones. Otto and König used even as much as from 60 to 120 grs., with no bad results. The authors' best effects were obtained with idiotic children, from doses of from 20 to 40 grs. No bad sequelae were noticed. In some cases, after large doses, nausea occurred. In comparing urethran and paraldehyde, Otto and König concluded that urethran produced more nausea and vomiting than paraldehyde, with less hypnotic action. In violent excitement, doses of even 120 grs. gave no marked relief, and the authors think it best suited to cases of slight depression and anxiety, such as were seen among their epileptic cases.

Dr. J. B. ANDREWS,[1] of Buffalo, N. Y., used urethran upon himself in health, and in more than twenty other cases, in doses of from 7 to 60 grs. He found it generally very useful, and most so when given in single large doses.

Dr. COZE[2] reported many experiments on animals, showing the antagonism between urethran and strychnine. In these experiments urethran suppressed the already existing convulsions of strychnine poisoning, and prevented the convulsions when given simultaneously with strychnine. The writer has not yet seen any reports of cases showing that there is an antagonism between it and strychnine in the human subject.

Dr. T. S. BENNETT[3] asserts that urethran is useful in the eclampsia of children, and in that of the puerperal state.

Dr. SANSOM[4] considers it as a harmless and efficient hypnotic in sleeplessness due to cardiac diseases with palpitation, but says that it soon loses its effect with use.

Drs. A. MAIRET and COMBEMALE[5] state that, in their experience, after from five to seven days, or even sooner, the action of urethran is so much diminished that it must be dis-

[1] Amer. Jour Insanity, Oct., 1886.
[2] Bullet. général de Thérap., April 30, 1886; Brit. Med. Jour., vol. ii, 1886, p. 176.
[3] Trans. Texas State Med. Assoc., 1887.
[4] London Lancet, Dec. 31, 1887.
[5] Compt. Rend., cii, p. 827.

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continued for some days. Others have not confirmed this observation, with the exception of Sansom (*loc. cit.*).

Drs. W. F. LOEBISCH and v. ROKITANSKY[1] observed diuresis, after urethran, in those cases in which the hypnotic action was good, but not in other cases. They often found urethran ineffectual in doses of from 30 to 60 grs.

Dr. DEMME[2] stated that 4 grs. of urethran is a sufficient dose for children from twelve to eighteen months old, 8 grs. between two and three years, and from 15 to 35 grs. between four and fourteen years, although larger doses may be safely given. Urethran may, according to Demme, be safely given to very weakly children, as it does not affect the circulation, respiration, digestion, or the nerve centres. Given by rectum, it is useful in non-organic eclampsia, and in the spasms of hydrocephalus.

Dr. RIEGEL,[3] of Vienna, used it sixty-seven times in twenty-seven cases, obtaining good results from it as a simple hypnotic, without anodyne effect.

Dr. J. P. CROZER GRIFFITH, of Philadelphia, and Dr. ELWOOD KIRBY,[4] reported the result of over sixty trials of urethran in nineteen cases of insomnia. "In only two cases was the hypnotic action really satisfactory, in a few others the effect was slight or doubtful, in three instances there were unpleasant secondary effects, and in the balance no action was witnessed." The dose used was 15 grs., and this was often repeated in two hours or less, and in one case as much as sixty grs. was given in one night without hypnotic effect. The authors, therefore, concluded that urethran is "an uncertain and unreliable hypnotic, though in large doses it will at times prove useful."

Mr. CONOLLY NORMAN,[5] after pretty extensive trials of urethran, concludes that it is uncertain, and of no great strength.

[1] Die neue Arzneimittel, 1888, p. 65.
[2] Internat. Klin. Rundschau, No. 4, 1888; Amer. Practitioner and News, Feb. 18, 1888.
[3] Dr. Ed. R. Squibbs, Ephemeris, June, 1888, p. 1084.
[4] Sajin's Annual of the Univ. Med. Sci., 1889, vol. v, A. 150; and Med. News, May 19, 1888.
[5] Dublin Jour. Med. Sci., Jan., 1889; Amer. Jour. Med. Sci., March, 1889, p. 278.

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The writer has tried urethran in forty-two cases of insomnia, and found it to be possessed of moderate hypnotic qualities, although not sufficiently powerful successfully to rival the remedies already mentioned in this paper.

(1) In regard to the *physiological action* of urethran, we have Schmiedeberg's authority for the statement that large doses of the drug induced loss of mobility with insensibility and unconsciousness in birds and mammals. The respirations were, however, increased in depth and frequency, and the heart beat strongly, sustaining the blood pressure at the normal point. Sensation persisted much longer than motion. The temperature fell. The reflexes were but little affected in the urethran sleep, and the pupils reacted well. Diuresis and diaphoresis sometimes occurred.

(2) Urethran is best applied *therapeutically* to primary insomnia of no great severity, to insomnia in cardiac diseases without great dyspnoea, and to that of moderate mental excitement, when sulphonal, amylene hydrate, and paraldehyde are too powerful or too obnoxious. It may render good service in the insomnia of melancholia, of general paresis, and of idiocy. It is said to antagonise the action of strychnine.

(3) It is *contraindicated* in insomnia from pain and cough, as it has no anodyne properties, nor is it powerful enough for use in delirium tremens, in mania, or in the excited stages of general paresis.

(4) It can scarcely be said to have *toxic* effects until very large doses, as, for instance, 180 grs., are taken. In some cases it has been known to cause nausea, late somnolency, and gastric distress.

(5) Being soluble in two parts of water, and being free from offensive taste, it may be given, by mouth or by rectum, in aqueous solution. It may also be used hypodermatically.

The adult dose varies from 15 to 30 grs. For children from twelve to eighteen months old, 4 grs. is a fair dose; from two to three years 8 grs.; and from four to fourteen years, from 15 to 20 grs. may be given. The average dose for hypodermatic use is 4 grs.

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V. HYPNONE.

Acetophenon, or hypnone, was discovered by Friedel in 1857, and was first recommended as a hypnotic, in 1885, by DUJARDIN-BEAUMETZ.[1] According to Dujardin-Beaumetz and BORDET, rabbits bore 3 grs. of hypnone without harm, but Guinea-pigs died in coma after the hypodermic administration of 7½ grs. Rabbits bore injections of 30 grs. quite well, but insensibility of the paw of the limb into which the injection was made soon occurred, the rabbits became dull and listless, and their temperature sank 1.6° C., but their normal state was restored in twenty-four hours. In dogs, ½ gr., by mouth, produced sleep and distinct palsy, while 45 grs. hypodermatically gave no results. When the drug was injected into a venous radicle, the arterial pressure fell considerably. Dujardin-Beaumetz and Bordet then experimented with human subjects, and observed in them the occurrence of deep, quiet sleep, after doses of 3 grs., within from twenty to forty minutes, and, in later experiments, within sixty minutes. When the drug was exhibited in capsules, dissolved in ether, the patients had a sensation of warmth in the stomach. When the patients awoke, their respiration and circulation were normal, and their appetite was often sharpened, perhaps by the irritating quality of the hypnone. Rarely were headache and hebetude observed. The blood, studied with the spectroscope, showed no changes. Dujardin-Beaumetz and Bordet's conclusions regarding the physiological action of hypnone are as follows: It has a three-fold action, diminishing the functional power of the nerves, lowering the arterial pressure, and, in toxic doses, decomposing the blood. Its hypnotic action is due to diminished cerebral circulation and to lessened nervous irritability. It is eliminated by the lungs and kidneys.

According to Drs. POPOF and NENCKI[2] it is decomposed, in passing through the body, into carbonic dioxide and benzoic

[1] Dujardin-Beaumetz and G. Bordet, Bull. Génér. de Thérap., Jan. 15, 1886, p. 1; Dujardin-Beaumetz, Gaz. Hébdom., No. xxiii, p. 4.

[2] Amer. Jour. of Med. Sci., April, 1886, p. 585.

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acid, and is eliminated in the urine as a hippurate. Popof and Nencki found the hypnotic action of hypnone very inconstant, and in some cases they obtained no results with it. They consider it much less efficacious than chloral, and hardly better than paraldehyde. They state that hypnone possesses no anodyne properties, and is thus useless in insomnia from cough, is of little value in the sleeplessness of acute fevers, and is most useful in nervous insomnia due to overwork or to alcohol in excess.

Dr. LABORDE[1] discussed the physiological action of hypnone. He reported that the injection of from 8 to 16 drops of it in Guinea-pigs causes deep stupour and death, the respiration being first rapid, and then slow and laboured. The pulse was increased in frequency, but lost its force. The temperature sank rapidly several degrees. In a dog, 48 drops, subcutaneously, did not produce sleep, and given by mouth it also failed to induce slumber, but caused vomiting. Given by intravenous injection, it instantly caused anaesthesia and deep sleep. The reflexes were dulled, arterial pressure fell, the pupils dilated, the heart's action grew feeble, and asphyxia supervened. Laborde refers the physiological action of hypnone to partial paralysis of the pneumogastric nerves, and depression of the cerebral motor centres. He regards the drug as too dangerous for general use.

Dr. GLASSET,[2] of Montpellier, recommends the use of hypnone by inhalation.

Dr. MAYET[3] recommends that hypnone be given in capsules, dissolved in sweet almond oil, as ether, when used as a solvent, causes very offensive eructations. The capsules contain about 1 gr. of hypnone. The offensive taste of it, and its irritating action on the stomach, make this method of administration preferable to all others.

Dr. L. HOIT[4] experimented with hypnone in doses of 1 gr., and later of from 1½ to 7½ grs., but found it quite inoperative,

[1] Gaz. Hébdom., Jan. 1, 1886.
[2] Thérap. Gazette, Feb. 15, 1886, p. 106.
[3] Les nouveaux Remèdes, Dec. 15, 1885.
[4] Breslauer ärtztl. Zeitsch., 86, No. 6.

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so that he considers it a very uncertain hypnotic, although devoid, in his experience, of harmful properties.

Dr. PH. REY, who used hypnone in doses of from 7½ to 15 grs., had only negative results.

Drs. MAIRET and COMBEMALE[1] observed paresis in animals to which toxic doses of it had been given, and referred this to depression of the motor centres. Mairet and Combemale found the action of hypnone, in doses of from 2½ to 7½ grs., uncertain, both with healthy persons and in insane patients. Only exceptionally did they note diminution of motor excitability. After the prolonged use of hypnone, the patients suffered from innutrition, and the haemoglobin of the blood was diminished. The uncertainty of the drug, its lack of anodyne properties, and its irritating action on the stomach assign to it a decidedly inferior rank among hypnotic remedies.

Dr. HANS ROTTENBILLER,[2] of Budapest, could obtain from the maximum doses which he employed, viz., 22 grs. in cases of alcoholism and of paralytic insomnia, sleep of only two hours' duration. In these same cases, from 30 to 60 grs. of chloral, and from 45 to 75 grs. of urethran, often caused sleep lasting all night. One paralytic patient remained awake all night in spite of a dose of 22½ grs. of hypnone. Rottenbiller, however, saw no evil results even from his large doses.

Dr. PENSATO[3] gives hypnone in capsules of 1½ grs. each. He believes that it is not inferior to chloral, and does not depress the circulation. In phthisis, hypnone is, according to Pensato, effective in doses of 4½ grs. at bedtime, and produces several hours' sleep. The cough is diminished, and the patient, waking refreshed, does not suffer from evil after-effects. Having noticed that hypnone has an antiseptic action, in virtue of which it delayed the decomposition of urine, and prevented the alcoholic fermentation, Dr. Pensato concluded that this antiseptic action might be exerted in phthisis. He, noticing that the cough and expectoration

[1] Archiv. de Neurolog., Jan., 1887.
[2] Erlevmeyer's Centralbl. f. Nervenkrank., 1887, 11.
[3] Lond. Med. Rec., Dec. 15, 1887.

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of phthisis were diminished by hypnone, subsequently employed it by inhalation, giving 5 drops every four hours by means of a mask-inhaling apparatus. The results were good, the cough was lessened, while the sputum was reduced in quantity, and changed from a muco-purulent to a mucous character. Dr. Pensato's average doses were from 4½ to 6 grs. Given in doses larger than from 7½ to 9 grs., hypnone causes pain and burning in the stomach.

Drs. HUCHARD and LABBÉ[1] recommended hypnone for nervous and alcoholic insomnia, particularly in single doses of from 3 to 6 grs. They found it useless in opium habitués, and in sleeplessness due to cough and pain.

Dr. BERNARD FISCHER[2] states that hypnone is particularly valuable in alcoholic insomnia, far surpassing chloral and paraldehyde in relieving this class of cases.

Mr. CONOLLY NORMAN[3] says that hypnone is so abominable in taste and smell that it is impossible to get patients to swallow it, and that, moreover, it seriously deranges the stomach.

The writer's experience with *hypnone* is too limited to justify him in formulating conclusions regarding it, based upon his own observations. From the articles quoted, the *physiological action*, as viewed by different authorities, is seen. *Therapeutically*, it may be used, in the absence of better hypnotics, in primary or nervous insomnia; but its effects are very uncertain, and, tolerance being soon established, larger doses are required than at the beginning of the treatment. It is *contraindicated* in sleeplessness from cough, and should not be given to patients with feeble stomachs. It is best *administered*, in doses of from 3 to 7½ grs., in capsules, or in almond oil. The writer's experience with hypnone has, however, been so disappointing that he has practically abandoned its use.

[1] Loebisch, Die neue Arzneimittel, 1888, p. 84.
[2] Die neue Arzneimittel, 1889, p. 120.
[3] Dublin Jour. of Med. Sci., Jan., 1889; Amer. Jour. Med. Sci., March, 1889, p. 278.

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THE NEW HYPNOTICS.

Discussed by

CHARLES G. STOCKTON, M. D., of Erie County,
JOHN G. TRUAX, M. D., of New York County,
and others.

DR. CHARLES G. STOCKTON.

[Read by title.]

The following observations are based on the clinical study of the drugs in question, with little reference to their literature:

"A pure hypnotic," one which will uniformly produce physiological sleep, it seems to me unphilosophical to search for, since wakefulness may result from so many varied conditions.

Sulphonal has proved to be a very satisfactory remedy in functional insomnia, the result of mental strain and worry. In overtaxed brain-workers it has had a fair trial, and has proved more successful than any other remedy in doses of from ten to twenty grains, given before the evening meal. The larger doses generally have been found unnecessary, and often objectionable because of the sensations of uncertainty and sleepiness on the ensuing day. Indeed, experience teaches that in mild cases a single dose of fifteen grains is required not oftener than every second or third night. It has succeeded in giving rest to several cases of insomnia, the result of excessive use of tobacco, and it has seemed to me that it lessened the craving which followed the disuse of the weed.

One interesting study was made of sulphonal for relief of the chloral habit. The patient, a woman fifty years of age, had taken from one to two drachms of chloral daily for over

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eight years. Her condition was deplorable, but she made a rapid recovery, discontinuing the chloral abruptly, and taking instead sulphonal, never more than forty-five grains in twenty-four hours. The remedy was gradually withdrawn, and within six weeks the patient had her needed sleep without the employment of medicines. It would seem that this use of sulphonal is deserving of especial attention.

For the relief of irritable children, sulphonal has failed in my hands. In insanity, it has at first afforded sleep to sufferers from melancholia with excitement, but only for a few nights, the dose having to be increased until unpleasant effects were noted, and even then the sleep was brief. In other forms of insanity it has failed.

In delirium tremens it was found to be very unsatisfactory: however, after the delirium had subsided, large doses of the drug occasionally served to relieve restlessness and favour sleep. Its action in the troublesome wakefulness of typhoid fever was studied in a large number of cases, and the results were very far from uniform. On the whole, it may be said to have been moderately successful, and no bad effects were noted after doses under thirty grains.

Sulphonal is often of great advantage in phthisis. Unfortunately, it after a time wears out, but, in most of the cases studied, it for some weeks afforded relief from the discouraging wakefulness; it lessened the night cough, and, in some instances, diminished the sweats. It is a very good medicine in phthisis, and the patients like its effects. It has seemed to me to resemble urethran in its behaviour, but it is a far more reliable and powerful hypnotic.

Its unpleasant after-effects are sometimes considerable, notwithstanding statements made to the contrary. In large doses it is a general depressant, but if given before a meal, and some hours before the expected sleep, large doses will be found unnecessary if the remedy is suitable to the case.

Paraldehyde has been found useful in selected cases. Its successful application was found to be in a shorter range of cases than that of chloral or sulphonal. In mental excite-

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ment following grief, worry, or over-work, it was often a suitable remedy, but failed more commonly than the drugs above mentioned. It was rapid in action, but the good effects were frequently evanescent. Besides its disagreeable taste, it occasionally disturbed digestion, and at other times it augmented the mental excitement.

It was not a successful substitute for chloral or opium when those substances had been used habitually, although it was sometimes a suitable remedy in delirium tremens.

In phthisis it was found to be impracticable because of its taste, and because doses large enough to relieve cough and wakefulness disturbed the patients on the day following. It appeared to relieve pain slightly, but rather more than did sulphonal. In any case tried it availed little in less doses than thirty grains; and double this amount failed to produce more than fitful sleep, disturbed by frightful dreams, in some instances of insomnia, the result of functional derangement. No trial of it was made on the insane.

Urethran appeared to be a gentle and harmless agent, but it generally failed where its effects were most needed. It seemed more comparable with sulphonal than with other hypnotics, as regards its mode of action, but was not to be compared with that drug as to reliability.

Amylene hydrate and hypnone were not given sufficient trial to warrant an account of them here.

The hydrobromate of hyoscine resembled closely in its behaviour the amorphous hyoscyamine of Merck. While not free from danger, its temporary employment was followed by the happiest results in those conditions of mania and transient delirium which could not be controlled by less potent means. Experience taught that it should be avoided when possible because of its depressing effects, but when in acute mania or delirium tremens safe doses of chloral were unavailing, a single dose of hyoscine or hyoscyamine, hypodermically administered, would sometimes give a favourable turn to affairs and render other medicines serviceable. It was considered to be a sedative rather than a hypnotic, and as one which led

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to uncomfortable dryness of the throat, headache, unsteadiness, profound circulatory depression, and rapid tissue waste. It was found to be far more reliable when introduced subcutaneously, and, as toxic symptoms were reported after the use of $\frac{1}{100}$ of a grain, a larger dose was not ventured in the beginning.

As I now reflect upon my experience with this alkaloid (and the amorphous hyoscyamine, which is practically the same), I wonder at the reputation which it seems to possess in some quarters for innocence and docility.

It is occasionally justifiable to injure a man in order to rescue him, and that, in my opinion, is precisely what we do when we obtain our best results from the use of hyoscine.

DR. JOHN G. TRUAX.

The time allowed for the discussion of this subject will not permit of a detailed statement or analysis of the notes taken and observations made in the study of the remedies here to be considered.

My remarks to-day will be based almost entirely upon notes taken in the Harlem hospital by my house physician, Dr. Woodend. In my private practice I have had occasion to use many of the so called new hypnotics, and the impression left upon my mind of their merit agrees in the main with these studies made in the hospital.

Sulphonal has been found to be more reliable in its action, and applicable to a greater number of conditions or diseases, than any of the other new hypnotics. For this reason it will be first considered. The diseases for which it is most appropriate are those in which the principal symptom is mild mania, or it may be given to relieve irritation and insomnia. The writer has had the opportunity to study its action when given to patients suffering from acute mania. It was given to thirty patients so afflicted, in twenty grain doses, with the following results: Ten went to sleep within two hours, and did not waken in less than eight hours; six slept four hours

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or more, and the remainder not at all. The dose was always repeated, did the first one have no effect within two hours. The second dose never finally accomplished what the first dose failed to do.

I am aware of the fact that the results I have obtained are not as good as those that others have reported from the use of sulphonal when given to the same class of patients. It has been given to several patients suffering with *delirium tremens*. In no case was its hypnotic action strong enough to control the delirium, or cause the patient to sleep for any great length of time. My experience with the new hypnotics in the treatment of this disease has been large enough to justify me in making the statement that no time should be lost in trying them. There is another condition, produced by the excessive use of alcohol, known as chronic alcoholism, for which sulphonal and the other new hypnotics are particularly well adapted. My history book, so far, fails to show a case in which they were not successful.

Sulphonal has been used by me in the treatment of a large number of cases of phthisis pulmonalis; always administered to relieve one or more of the following symptoms,—cough, night sweats, restlessness, and sometimes pain. It generally controlled the cough, but had but little if any effect upon the sweating. Almost invariably the patient obtained seven or eight hours' sleep after taking twenty grains of sulphonal, and whatever pain was present was subdued. It had no depressing effect upon the heart: twice only, following many hundred administrations, was this condition observed, and then in a very limited degree. Patients nearly always wakened in the morning much refreshed by their long sleep, and remained cheerful during the greater part of the day, sleep being generally produced within an hour and a half from the time of taking the medicine. It has been given to relieve slight pain, restlessness, and insomnia to several patients sick with acute labor pneumonia. Many times it acted favourably, causing the patient to sleep for several hours. This long rest not only made the sufferer more cheerful, but

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actually improved the action of the heart. I do not wish to convey the impression that it is a remedy to be relied upon in the treatment of all cases of pneumonia, but that it can be given in some cases, and, without danger to the patient, relieve many distressing symptoms. It does not add to the danger of death from heart failure.

Another disease, in the treatment of which sulphonal can be used with marked benefit, is acute articular rheumatism. All who have had a large experience with patients so afflicted can without much trouble recall to mind the flushed cheek, the pained expression, and the irritable manner of these restless sufferers. A number of times have I seen these disagreeable symptoms disappear after the administration of a full dose of sulphonal. Like its narco-hypnotic brother, morphine, it sometimes seems to cut short the disease. Never, however, in the event of failure, does it leave the unpleasant after-effects peculiar to morphine.

Painful menstruation is another condition, to relieve which sulphonal has been given. I can never forget the success that attended my first attempt to relieve a patient suffering in this manner. She had always had more or less pain during the menstrual period. A careful examination did not reveal the cause, but the administration of 20 grains of sulphonal relieved her to such an extent that she fell into a peaceful sleep which lasted all night. Subsequent use of this remedy to relieve the symptoms just described has not met with success. Indeed, my failures have been so numerous that I have abandoned its use in the treatment of painful menstruation.

Sulphonal was used in one case of pericarditis with effusion. It relieved the pain, caused the patient to sleep, and did not depress the action of the heart. It was used, whenever indicated, in twenty grain doses during the whole course of the disease.

It has been given to allay irritation and slight pain after minor surgical operations, generally with good results.

Two cases of meningitis were treated with sulphonal and

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the ice cap: while both terminated fatally, the patients were as comfortable and the delirium controlled as well as by any other treatment.

Delirium, following partial recovery from asphyxiation by illuminating gas, was controlled by 30 grains of sulphonal.

Sulphonal has been given to several other single cases, always with the one object in view, namely, to produce sleep. To name them all would make this paper too long. The writer has given sulphonal as a substitute for morphine to persons who had acquired the opium habit. No good results followed its use in these cases. Sulphonal can be given in capsules, syrup, milk, or, best, in hot soup. No toxic effect was ever observed by the writer. The largest dose ever given by him was 40 grains.

Amylene hydrate, in doses of 45 grains, was found to be almost as strong a hypnotic as sulphonal. It was used by the writer in about the same class of diseases. It is not quite as pleasant to take, nor as safe.

Paraldehyde, in doses of 45 grains, has a hypnotic action about equal to that of the same quantity of amylene hydrate. The patients frequently complain of a bad taste in the morning after taking paraldehyde. The writer is quite favourably impressed with the drug.

Hydrobromate of hyoscine, $\frac{1}{100}$ grain in solution given at a time, was found to be a very good hypnotic. It quite frequently irritates the stomach. It is also very expensive.

Urethran in doses of 15 grains each, and hypnone in doses of 6 grains each, have been given a great many times. The writer was not so favourably impressed with their action as he was with the hypnotic effect of the other drugs mentioned.

Several times the writer has tried all the new hypnotics named upon the same case, thus affording him the opportunity of studying their effects relatively. It was found to be about in the order in which their names occur. None of the new hypnotics were found to have a decided depressing effect upon the heart. In the doses here mentioned no toxic action was ever observed.

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OPEN DISCUSSION.

[From Stenographic Report.]

Dr. Charles Rice said that not being a medical man he would confine himself to a consideration of the chemical and pharmaceutical aspects of the hypnotics under discussion. He thought the rate of consumption of the drugs expressed pretty accurately their usefulness. He handled a large amount of drugs of various kinds. Up to the present time, in the department in which he had charge of drug supplies, he had purchased some eight ounces of hypnone, from which he had supplied various institutions and insane asylums; but seven and a half ounces still remained in his possession. Only half an ounce had been used, because the patients refused to take it. It is not a pleasant substance, and it is difficult to make pharmaceutical preparations which will make it agreeable, so that it is preferable to use other more attractive hypnotics.

There seemed to be a peculiar objection to amylene hydrate, not on account of its taste, but because of its after-effects. He had known sugar to appear in urine after its exhibition.

The next drug in the order of consumption is urethran. With regard to that drug, he said that he believed only three firms manufactured it, and that some samples found in the market had a very bad odour. It is made by the action of nitrate of urea upon ordinary alcohol. During this process a secondary reaction takes place, which results in the formation of a substance of unknown chemical constitution having a mouse-like odour. All the commercial urethran has this odour: that which has the least of it should be the one selected for use.

Paraldehyde is used more than any of the others because of its cheapness. Sulphonal, which is a better hypnotic, is still quite expensive. Paraldehyde has one disadvantage, aside from the therapeutic one: it imparts to the breath a very peculiar, disagreeable odour, which persists from twenty-four to thirty-six hours after its administration.

Sulphonal is as yet certainly the most available of all hypnotics, but it has great disadvantages. It is very difficult to produce a quick effect by its use, as it is almost insoluble in water.

Experiments have been made with a whole series of chemical compounds having constitutions like that of sulphonal. He did not desire to enter into deep chemical explanations, but this matter was so simple that it could readily be made clear. Methane is a compound of carbon and hydrogen, in which one atom of carbon is united to four atoms of hydrogen. Imagine the carbon having four arms, each one holding an atom of hydrogen. Each one of those hydrogen atoms may be replaced by an atom of some other element, or by some radical. If two of these

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atoms are each replaced by the sulphonic acid radical SO_2, and the latter in turn united to the radical ethyl C_2H_5, there will still be two atoms of hydrogen which have not been disturbed, and which remain united to the carbon atom. These may be replaced by the radicals methyl, CH_3, or ethyl, C_2H_5. By varying the number and nature of these substitutions, a large number of changes are possible. The sulphonal now used is the one containing ethyl with the two sulphonic radicals, and meythl in the place of the two remaining hydrogen atoms. A substance called etronal has been produced by replacing both methyl radicals with ethyl. The whole series of sulphonals would probably in time appear. There was a competition among manufacturers as to who should be the one to whom the manufacture was entrusted, because there are millions in it, as in the case of antipyrine.

In connection with hydrobromate of hyoscine, he recalled the fact that five or six years ago the attention of the profession was directed towards hyoscyamine. He procured the best that could be had, and it was sent to the asylum and used with great care, but proved unsatisfactory. As far as he could ascertain, it was perfectly pure. About that time a new alkaloid was discovered in hyoscyamus, hyoscine, which was successfully isolated and proved to be the real hypnotic. The crystalline sulphate of hyoscyamine appears to have little value. At present, hyoscine is very expensive. A grain costs forty cents; but since it is known that the amorphous hyoscyamine contains about forty per cent. of hyoscine, the speaker suggested that, where economy must be practised, it might be used.

The speaker then said that it had recently been shown that belladonna contained no atropine, or, at least, that this was true of a particular lot of the root which had been studied in Berlin. What existed in the root was hyoscyamine, which could be converted into atropine, and the latter again into hyoscyamine.

Dr. SQUIBB, of Kings county, expressed himself as having a conservative feeling respecting these new drugs. Dr. Rice had alluded to there being millions in their manufacture, and to the fact that those most largely advertised were those most largely used, and of which the best results were reported. These facts alone should instigate an attitude of conservatism towards them. He said that sulphonal, which sells for a dollar and thirty-five cents, costs about fifteen cents for its manufacture. It is controlled by a patent in this country. He also called attention to the fact that none of these new hypnotics could be given hypodermically. They are all only slightly soluble, and this probably occasions the slowness of their action. The secretions of an unhealthy stomach would have less solvent action on sulphonal than those of the stomach during health, so that when most needed its action would probably be slowest. The same is true of paraldehyde.

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With respect to what had been said of hyoscine, he said that there was no proof of the existence of any alkaloid in any plant. We do not know that morphia preëxists in opium, nor that hyoscyamine exists in hyoscyamus. What we get out of those drugs is what the process we employ yields to us.

Dr. A. L. CARROLL, of New York county, referred to the different doses of sulphonal advised by different authors, and thought that the differences in their experiences might be due to a deferring of the action of a part of the drug given, because of its insolubility and slowness of absorption. He had succeeded in dissolving some of the drug in warm alcohol, but one drop of dilute hydrochloric acid had precipitated all the sulphonal from the solution.

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PELVIC CELLULITIS IN WOMEN.

By Wm. H. Robb, M. D., of Montgomery County.

I doubtless owe an apology for asking your attention to the subject of Pelvic Cellulitis in Women. Much has already been written on the subject. Great diversity of opinion among medical men now exists as to its location, nature, and results. If I can furnish you with sufficient evidence to prove conclusively that we may and do have uncomplicated cases of pelvic cellulitis, I shall feel satisfied.

Dr. Thomas says that it was understood by Archigenes, who wrote of it in the second century, and by Oribacius who flourished in the fourth, and also by Aetius and Paul of Aegina who described it in the sixth and seventh centuries. It is not a new disease. It is one with which the general practitioner frequently meets. Its importance may be understood by considering the two following quotations: Dr. T. A. Emmet says,—"I do not exaggerate when I assert that pelvic cellulitis is by far the most important disease with which woman is afflicted." J. Matthews Duncan remarks, that "Parametritis, or inflammation of the cellular tissue around or in connection with the womb, is one of the most important subjects in gynaecology."

The disease has been described by different writers under different names as follows: Parametritis, peri-uterine cellulitis, pelvic abscess, phlegmon of the pelvis, and pelvic cellulitis. Lengthy articles on these different topics may be found in the medical literature of the present century. I have selected the term pelvic cellulitis in preference to any of the other names, because I believe it conveys more clearly the nature and location of the diseased tissue. An inflamma-

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tion existing in any portion of the pelvic connective tissue should be considered under the title of this paper. The cellular tissue of the pelvis does not differ in its anatomical structure from that in other parts of the body. Neither does it differ in its physiological functions. It separates, surrounds, and supports each of the pelvic viscera, unless it

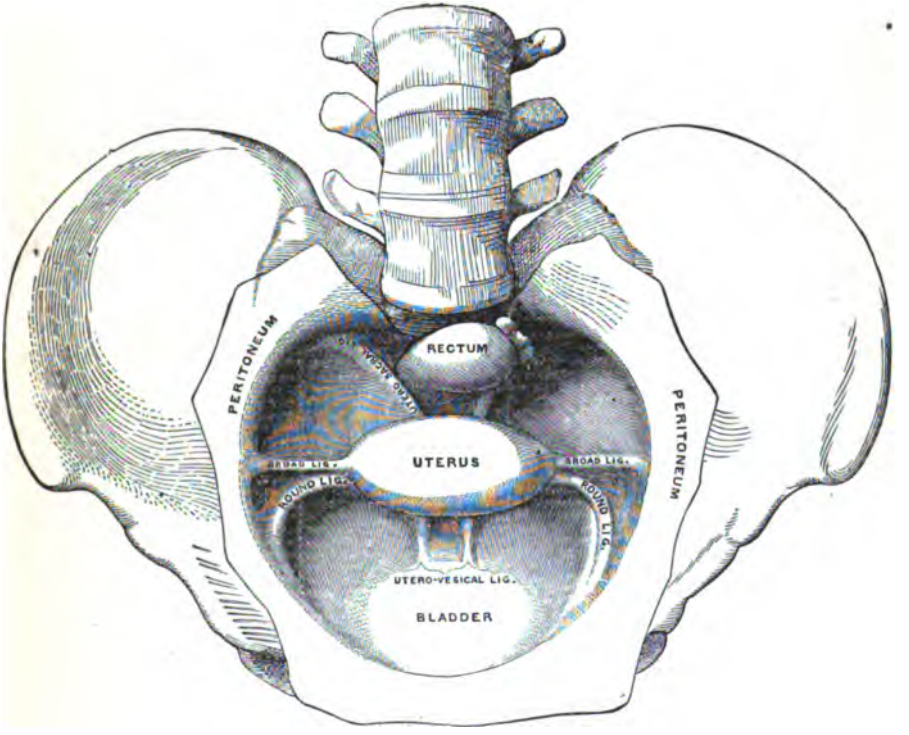

FIG. 1.—Diagrammatic Superior View of the Female Pelvis, showing the reflections of the Pelvic Peritonaeum.—(Hodge.)

be that portion of the uterus that is covered immediately by the peritonaeum. The pelvic peritonaeum has been beautifully illustrated by Hodge, whose drawing I present to you.

This, at a glance, gives you a clear idea of the extent of this delicate membrane, and its relation to the different pel-

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vic viscera. Much of the under surface of this membrane comes directly in contact with the connective tissue of the pelvis. The cellular tissue not only surrounds and supports the different pelvic organs, but reaches up between the folds

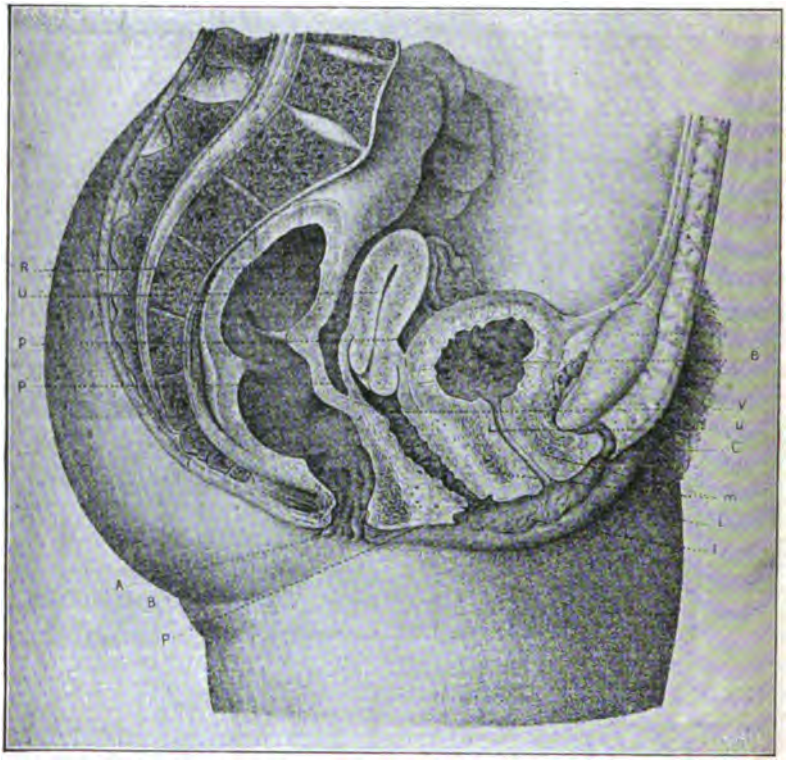

FIG. 2.—Median Section of the Pelvis, showing both Pelvic Spaces. A, Anus; R, Rectum; U, Left half of Uterus: V, Vagina; B, Bladder; C, Section of Clitoris; L, Vulvar labium; I, Nympha: P, Perineal body; U, Urethra; PP, Vesico-Uterine and Recto Uterine Peritoneal Folds.—(Surg. Anat. of the Female Pelvic Organs. Henry Savage. Pl. XIII.)

of the peritonaeum that constitute the different uterine ligaments.

The distribution of the connective tissue of the pelvis is nicely illustrated by two drawings that I present to you. The one (Fig. 2) by Savage is a vertical section through the

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pelvis, the other (Fig. 3), by Fritsch, a transverse section through the pelvic organs. From these drawings, more than from words, you will get a clear idea of the extent and location of the areolar tissue.

With these anatomical structures so closely and intimately connected, one can hardly realise that an inflammation of any magnitude could exist in the one without at the same time causing a slight affection of the others. This condition, I believe, does often exist in pelvic affections. In one patient the peritoneal disease predominates; in another, the cellular.

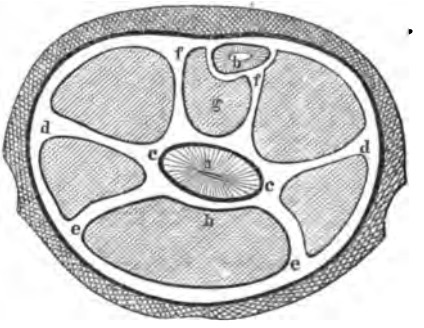

FIG 3.—Diagram of a horizontal Pelvic Section. a, Uterus; b, Rectum; cc. Parametrium or lateral margin of the Uterus; cd, cd, Broad Ligs.; ce, Round Lig.; cf, cf, the folds of Douglas; g, fossa of Douglas; h, Vesico-Uterine Excavation, behind it the connective tissue between the bladder and uterus; e, d, f, d, e, Subperitoneal connective tissue.—(Fig. 147, Fritsch Diseases of Women.)

No one ever saw a case of pneumonia in which at the same time there was not a slight pleurisy. Neither do we have peritonitis without at the same time having enteritis. Now, if you concede the propriety of naming an inflammation of the lung, in which the pleura is principally involved, a pleurisy, and another a pneumonia because the parenchyma is the seat of the inflammation, then, I think, with the same truthfulness and propriety we should be warranted in naming an inflammation that is confined more or less completely to the pelvic connective tissue a pelvic cellulitis.

The pelvic viscera are all abundantly supplied with blood-vessels. The connective tissue conveys these vessels to the point of their distribution, and receives a very abundant supply of blood from them. It is doubtless owing to the vascular condition of this tissue that it owes its disposition to take on inflammatory disorders.

The medical profession is divided as to the location and

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importance of pelvic cellulitis. Some would teach us that the milder forms of pelvic inflammation are of but little moment, while others would attach great importance to the very mild attacks. One thinks the disease harmless, while others believe it to be far-reaching and dangerous.

So much has been said and done of late by a few writers on the subject of pelvic inflammation, that I am compelled to stop and ask myself squarely, Does the connective tissue of the pelvis ever suffer from inflammation uncomplicated? Some will say it does not.

Dr. Wm. H. Polk, in an exhaustive article on the subject of Peri-uterine Inflammation, published in the Medical Record of September 18, 1886, on page 910, gives his conclusions as to the nature of the inflammatory masses commonly met with about the uterus and broad ligaments as follows:

"In this inquiry, the position which I desire to occupy is this: First. That the inflammatory masses commonly found about the uterus, and which are described under the headings 'Pelvic Cellulitis' and 'Pelvic Peritonitis,' are the result of salpingitis plus peritonitis, the tubal disease being the direct result of disease of the uterus; that such masses are composed of the tubes and ovaries, with sometimes adjacent viscera, the whole being united by recent or organised lymph, the inter-spaces in acute cases, and sometimes in chronic cases, being filled with a serous exudate; that such swellings may be augmented by secondary infiltration of the adjacent sub-peritoneal connective tissue, but such infiltrations are subordinate in extent and influence to the peritoneal inflammation. Secondly. That these masses do not originate directly from the uterus or vagina as a cellulitis, except as the consequence of an evident septicaemia ingrafted upon those organs after an abortion, a miscarriage, a labour, or after some operation; that even in such cases it is more than probable that salpingitis and peritonitis will be associated with and predominate over the cellular inflammation; that when these masses do begin as a cellulitis (the patient surviving the septicaemia) they rapidly tend to suppuration; that they

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end very rarely in the chronic indurations or swellings under consideration in this paper." This theory is supported by clinical reports given of sixteen cases.

Dr. W. Gill Wylie, in a discussion on intra-uterine medication, made before the N. Y. S. M. Society of 1887,[1] says that "If we can exclude diseased glands and follicles, and also diseased tubes and ovaries, there will then be no mysterious inflammation. I do not believe in cellulitis, except as an attendant upon phlebitis, a lymphangitis, or associated with diseased glands and follicles in the mucous membrane, or as very frequently associated with diseased tubes and ovaries. I believe that nine tenths of the cases that we have called and treated as cases of cellulitis are nothing more nor less than cases of diseased tubes and ovaries. If the condition is bad enough to warrant it, you can remove the organs, and your so called adhesions and mysterious inflammations will disappear."

These reports and statements, made in honesty and sincerity, are of great importance. They establish the fact that in a few cases an inflammation may involve the different pelvic viscera without at the same time seriously affecting the connective tissue. They do not, however, prove that we may not have serious and dangerous inflammation confined to the connective tissue, and in which there is no affection of either tube, ovary, or peritonaeum.

I must insist that the cases in support of the theory advocated by Polk and Wylie are very rare ones, and seldom met with in private practice. They are especially rare when compared with the whole number of patients who suffer from pelvic inflammation. The major part of these patients recover, and that without laparotomy, unless the operation be indicated for the purpose of evacuating collections of pus.

To establish the fact that severe and extensive inflammation may involve the connective tissue of the pelvis without seriously affecting either of the other viscera, I shall refer to post-mortem and clinical reports of well authenticated cases.

[1] Transactions of the Medical Society of the State of New York, 1887, p. 226.

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Dr. T. G. Thomas, in his article on Peri-uterine Cellulitis, Diseases of Women, page 479, gives the post-mortem reports of fourteen cases of this disease. I will only include that of a single one made by M. Simon.

Dr. Simon states that in this case the purulent collection was of the "size of a small orange, between the bladder and uterus, sending conoidal prolongations into the left broad ligament. Its limits were as follows: Base of bladder in front; neck and body of uterus behind; peritonaeum above; vagina below; at the sides it ran off into the broad ligaments." The disease had in this case been confined entirely to the areolar tissue around the cervix and between the broad ligaments. No mention is made of any complicating affection of either uterus, tubes, ovaries, or peritonaeum. Many other reports are to be found in medical literature. They may be found in journals, transactions of societies, and in text-books. Dr. A. J. C. Skene, in his book on Diseases of Women, published in 1889, in treating of the subject of pelvic cellulitis, includes the reports of many very instructive cases. I hope you will pardon me for including two of these reports in full.

Dr. Skene[1] reports the following case:

Pelvic cellulitis ending fatally from septicaemia. About sixteen years ago, while in charge of the lying-in department of the Long Island College Hospital, one of my cases developed a metritis and cellulitis after confinement. The case progressed in the usual way, differing in no respect from many cases of the kind except that the products of the cellulitis were unusually great. The metritis subsided, and the cellulitis, which was located in the left broad ligament, went on to suppuration, and while I was looking for the abscess to discharge, the patient began to show signs of septicaemia. There was, no doubt, a large accumulation of pus in the broad ligament; but, as we were unable by physical signs to determine that, I unwisely abstained from exploring the abscess. All constitutional treatment known to us was carefully employed, but the patient died. On post-mortem examination, a very large abscess was found in the left broad ligament, and nothing more. The peritonaeum covering the abscess was congested, and there was much subserous oedema, but not the slightest evidence of peritonitis.

[1] Page 573.

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Dr. Skene[1] reports another case, and one more instructive than the first:

The patient was thirty-seven years old, and had been confined of her fifth child four months previous to the time that I first saw her, in consultation with Dr. R. L. Dickinson. From the history that we could gather, she had fever from the day after her confinement, and had been sick ever since. She was emaciated, and her skin dry and dusky, the temperature ranging from 101° to 102°. She had but little appetite, and was constipated. She rested on the right side, with the legs and thighs flexed, and complained of severe pain in the right groin and leg. Owing to the flexed position of the right leg, and the great pain she suffered in moving, a physical examination was not easily made. The uterus was apparently normal and movable; but high up, at or above the brim of the pelvis, on the right, there were evidences of inflammatory products. The diagnosis of abscess in the false pelvis causing septicaemia, was made. She was taken to the hospital, and explorations were made with the aspirator in the hope of finding the exact location of the pus, but with negative results. Laparotomy was performed by Prof. Charles Jewitt. The pelvic organs were normal, except that there were evidences of a former cellulitis in the upper portion of the right broad ligament. The presence of pus was made out in the right iliac and lumber regions. The abdominal wound was closed, and an opening made above the right groin into the abscess. It was found that the abscess cavity extended upward along the spine for twelve inches. The subsequent treatment consisted in washing out the abscess cavity, and supporting the patient with nourishment and stimulants. She did not rally well, but gradually failed, and died the third day after the operation. The autopsy showed that the abscess cavity extended from the right broad ligament upward behind the kidney, and to the right of the spinal column to the diaphragm. The psoas muscle was involved in the abscess, but there was no bone disease, and it was the opinion of all who attended the autopsy that the disease began as a cellulitis of the right broad ligament.

Dr. Skene cites other cases, as instructive and conclusive in support of the existence of cellulitis as a separate and distinct disease of the pelvis as those already given. These last reports, coming from the pen of one of our most distinguished surgeons,—one whose judgment and honesty no one will question,—should, in my opinion, settle the fact that we do have pelvic cellulitis as a distinct disease.

[1] Page 577.

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The pathological history of this disease differs in no way from the history of inflammation confined to the areolar tissue in other parts of the body. In the beginning of the disease we find (1) a stage of irritation or congestion; (2) a stage of effusion of liquor sanguinis and induration; and (3) a stage of suppuration or softening. The duration of these several conditions or stages varies much in each individual patient. In one, the disease may be checked during the stage of congestion; resolution occurs immediately, and the patient is restored to health. In a second case, the stage of effusion may last for months or years without going on to suppuration. In a third case, the stage of suppuration begins early, and after the pus escapes, either through an opening made by nature or artificially, the patient soon recovers. There is an individuality about this disease that I have never found in other affections. Why in one patient the disease passes from one stage to the other in rapid succession and terminates favourably, while in the next person the stage of effusion or suppuration may last for months or years, is more than I can explain. In fact, I have seen no explanation of these facts offered. I am inclined to believe that these differences in the progress of the disease, as exhibited in the histories of different patients, may be explained by referring to the constitutional habit of the woman. I believe both the second and third stages of this disease are protracted in patients with the scrofulous habit. They seem to me to be more susceptible to the inroads of the inflammation. Be this as it may, I have found my most tedious cases in members of strumous families.

The second stage of the disease may, and often does, terminate in resolution. This is its most favourable termination. It may become, as it were, chronic, and last indefinitely.

The third stage, or that of suppuration, varies much in its duration. In favourable cases, where the abscess points in an accessible location, the pus may be evacuated through the efforts of nature or the surgeon's knife, and the patient thus

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make a rapid recovery. This stage of the affection may be protracted from different causes. In some, the whole of the inflamed tissue will be involved in the suppurative process, and the pus finding a favourable outlet may be evacuated at once, when the walls of the abscess will unite, and the patient is well. If, however, the suppurative process involves only a portion of the inflamed tissue at one time, the course of the disease is necessarily protracted. Recovery is retarded in cases in which the pus finds an outlet through some tortuous course.

Dr. Skene, in his book,[1] reports one case in which the inflammatory deposit became honey-combed by multiple abscesses. The pus usually finds an outlet through the vagina, rectum, bladder, or, more rarely, through the peritonaeum and pelvic walls. I have known it to escape through the walls of the abdomen, at the umbilicus, in the inguinal region, and at the side of the vulva and near the anus.

The most frequent cause of pelvic cellulitis is the absorption of septic poison from the genital canal through rents made in it during labour or abortion. It may result from injury done by surgical operations upon the cervix or vagina. The use of tents, pessaries, and caustics has been followed by cellulitis. It is caused in many cases by exposure to cold.

Dr. Lusk[2] says,—"Indeed, I have frequently in hospital practice been able to trace severe cases of cellulitis, pelvic peritonitis, and general peritonitis, occurring in the winter season, to the patient getting out of bed dripping with perspiration, and clad only in a night-dress, and going thus barefooted over a cold, uncarpeted floor to the water-closet."

I have known it to result from standing out in the snow on a toboggan-slide; also, from sitting out on cold stone steps, and from riding long distances over rough roads. It is, doubtless, caused by preëxisting inflammation in the uterus, tubes, ovaries, and peritonaeum. It has been observed by Drs. Emmet and Fritsch in young girls and old women

[1] Page 572.
[2] Science and Art of Midwifery, p. 667.

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in which there was no disease of the uterus, tubes, or ovaries. Dr. Emmet[1] records the history of two cases of cellulitis in children between eight and ten years of age, and also the history of fifteen cases in women who had passed the menopause. Dr. Aran reports the result of an autopsy on a woman eighty years of age, in which he found at the side of the uterus, encroaching upon the lateral wall of the vagina, a swelling that consisted of "indurated cellular tissue."

An acute attack of cellulitis begins, as a rule, with a chill, followed immediately by a quickened pulse, and a little later by fever, and pain in the lower part of the abdomen. The initial chill may be slight, lasting but a few seconds, or it may be severe, and protracted for half an hour or more. The severity and duration of the chill often correspond with the severity and duration of the disease that follows. The pulse-rate in these cases is always quickened, and ranges between 110 to 120 per minute. If the disease should be complicated by peritonitis, or involve an unusually extensive portion of connective tissue, the pulse will range higher, and it will sometimes reach 140 or 160 per minute. Its frequency is suggestive of the seriousness of the sickness. The temperature will range from 100° to 104°, and in extreme or complicated cases, it will reach 105°. The temperature will be one degree higher in the vagina than in the mouth, and Dr. Emmet suggests that it be taken for exact observations in the vagina. If the temperature continues high for a number of days, with but slight variation from morning until evening, we should consider the patient in great danger.

In puerperal cases these symptoms are usually announced on the second, third, or fourth day after delivery. In addition, the patient suffers from headache, wakefulness, nausea, occasionally vomiting, dry tongue, hot skin, and tenderness over the lower portion of the abdomen. By digital examination in this early stage we often find the vaginal walls hot and tense. The patient usually lies on her back with her

[1] Diseases of Women, p. 249.

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limbs drawn up. Resolution may begin at this stage of the disease and all the symptoms gradually subside, and the patient be restored to health. If, however, the illness continues, we have many of the constitutional symptoms remaining, very much as they have been described, or they may be slightly improved, as the second stage or that of effusion occurs. By touch, we find hard, firm, and irregular masses located in different portions of the connective tissue, the result of inflammatory effusion. They are first detected at the side of the uterus, extending up into the broad ligament. The effusion may, and sometimes does, involve the connective tissue on both sides of the uterus, and then extend to the whole of the areolar tissue of the pelvis. From the pelvis the inflammatory deposit may be spread out over the anterior and posterior walls of the abdomen by an extension of the disease to the connective tissue of these parts. This hardness is peculiar. To the sense of touch it is firm, like a board—woody. It is frequently irregular in shape, and slightly nodular. It is rarely smooth and regular in outline. It fixes the uterus, and often crowds it into an abnormal position. The uterus is forced to the opposite side of the pelvis by the thickened tissue, and sometimes it seems to be almost lifted out of it, so much so that one cannot reach it by touch. Resolution may begin at this stage of the disease. All the constitutional symptoms improve, after which the inflammatory deposit will be gradually absorbed. Thus the illness may end favourably in a few days or weeks.

In many cases of cellulitis its duration is more protracted. The indurated masses remain after the more acute constitutional symptoms have subsided. The disease becomes chronic. Women suffering from the chronic form of cellulitis are aenemic, debilitated, exhausted, and tired. They suffer much from neuralgia. The pain may be confined to a single nerve branch, or it may affect different ones at the same time. Many are extremely nervous, some are hysterical, and a few are melancholy. In many the digestion is poor, and their bowels constipated. By touch, the physical condition of the

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pelvic organs is found to be much the same as already described. The woman may tolerate a little more pressure from the finger than at first, although I may say that she is never able to bear firm pressure, without suffering pain, until the disease is entirely removed. To be sure, many women are so far relieved from their suffering that they are able to be about and attend to light household duties. Others are less fortunate, and become confirmed invalids, while a few take to and keep their beds for years.

In the third or suppurative stage of this disease we have, added to the symptoms already described, those indicating the formation of pus, or, later, those indicating septic poisoning. I shall not attempt to describe them. You are all familiar with the chill, sweating, emaciation, hectic, and delirium that accompany this stage of the affection. As suppuration extends, the physical condition of the pelvic organs is very much changed. The hardened mass begins to soften, and in some women this condition may be detected by touch, while in others the deposit is so deep seated that it cannot be reached in this way. In some cases the suffering of the patient is so severe and the tenderness so extreme that it is impossible for days to make an examination. In such cases we rely on the constitutional symptoms alone.

To differentiate this from other diseased conditions, it will be necessary to refer to those diseases with which this is liable to be confounded. As such we may enumerate pelvic peritonitis, fibroid and malignant tumours of the womb, haematocele and inflammation of the tubes. In malignant and fibroid disease the history of the case will settle the diagnosis. This may, however, in rare cases require a second examination. In haematocele the tumour is formed suddenly, and has no history of preceding inflammation. In cases of any magnitude the condition of the patient is one of marked depression, with slow and feeble pulse. In pelvic peritonitis the attack is sometimes preceded by gonorrhoea. The symptoms described as initial to cellulitis are present, and, I may say, intensified in pelvic peritonitis. The chill is more pronounced,

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the pulse more frequent, and the temperature is more elevated. The abdomen is more distended and tense, and the facial expression is more pinched and anxious. By digital examination we find the swelling located in Douglas's pouch, and usually regular and rounded in shape in pelvic peritonitis. Salpingitis is often preceded by gonorrhoea. In a few cases its existence may be detected by careful manipulation. In most cases its existence is only positively settled by abdominal section.

The treatment of pelvic cellulitis is begun by directing our attention to relieving the first chill, if we are called to the case promptly. This is done by the use of hot drinks—herb tea, hot sling, &c.; the use of hot flannels wrapped about the body, and the application of hot bricks, bottles filled with hot water, &c., to the extremities, together with gentle friction made under the clothing, particularly to the extremities. This done, I should advise the use of ¼ gr. of sulphate of morphia, administered hypodermically, for the purpose of relieving both pain and restlessness. Given in this way, I believe it acts more promptly, and is less likely to disturb the stomach than when it is administered by the mouth or rectum. I prefer Squibb's fluid extract of veratrum in single drop doses, given at intervals of one or two hours, to any other remedy, not only to reduce the pulse rate, but also for the reduction of temperature. I believe this is as safe in the early stage of an acute attack as any other medicine. I believe it will abort an attack in many persons if given at once and with regularity. The size and frequency of the dose must be regulated by the condition of the patient's pulse. If the pulse rate is brought down to seventy per minute, the dose should be lessened or the interval between the doses lengthened. Thin flax-seed poultices, made large enough to cover that portion of the abdomen that is tender, should be heated in a steamer and applied hot to the abdomen, and quickly covered with oiled muslin. These should be renewed frequently, but carefully, so as not to allow the body to be chilled in making the change.

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If the attack has followed either labour or an abortion, I would curette the womb, and thus make sure of the removal of any foreign or septic masses from within its cavity. This done, I would carefully wash out the organ with a 1 to 20 solution of carbolic acid, and introduce into the cavity of the womb a 60-gr. suppository of iodoform. If this has been carefully and thoroughly done, I believe no more intra-uterine medication will be called for.

Dr. T. A. Emmet believes that a hot vaginal douche given continuously for a long time may abort the disease. In the treatment of cellulitis I always employ the douche as advised by him, unless I find the movement of the body, made necessary for its proper administration, adds to the woman's suffering. From this cause, in a few cases, I have been obliged to omit its use. The patient's bowels should be moved on the second day by a simple enema, or by the use of small doses of calomel. If the stomach is irritable, I prefer the mercury. I believe it has a wholesome effect on this affection by unloading the portal circulation. The diet of one suffering from this disease should receive our careful consideration. In the early or acute stage it should consist of mild liquid food, mostly milk. It will vary much in different patients, owing to their peculiarities, and must be regulated according to our best judgment. It may require daily changes.

In the treatment of chronic cellulitis, we must, first of all, direct our attention to those measures that will be best suited to build up and nourish our patient. If we can improve digestion and assimilation, we can generally restore our patient to health. To this end I would advise the use of different bitter tonics and the mineral acids, changed from time to time as each case might seem to require. I would use some mild laxative that would insure one free motion of the bowels daily. I would use a blue pill twice a week, for the purpose of stimulating the portal circulation. In addition to plain food, I would use maltine, maltine with cod-liver oil, and cod-liver oil alone given with wine. When the

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condition of our patient will permit, we should encourage as much out-door life as possible, and as strength returns, short walks, short of tiring, should be encouraged. Change of residence should be advised. Those living in the city are improved by a visit to the country, and those living in the country are benefited by a residence in the city. A sea voyage does much good for these patients, as does a tramp in the Adirondack wilderness. A visit from home, if the husband is left behind, is always followed by good results.

The local treatment of women suffering from chronic cellulitis is quite as important as the medicinal and hygienic. I have had such good results follow the use of the hot water douche, administered as first suggested by Dr. Emmet, that I should consider myself criminally negligent if I did not advise its use in this condition. I would use the compound tincture of iodine, applied locally through Sims's speculum, twice or three times a week. I say Sims's speculum, because I believe no other instrument can be used safely in women suffering from cellulitis. Women whose pelvic vessels are much congested are often benefited by the use of a glycerine tampon made of absorbent cotton or antiseptic wool, and applied at bedtime well up to the cervix. I have been obliged to discard the use of the tampon in a few very nervous women, on account of the unpleasant symptoms that follow its use. I have found good results from the use of mild currents of both the galvanic and Faradic battery. I believe it is good practice to alternate the use of the two currents. After using the galvanic for a time, I would try the Faradic. I believe the circulation in the pelvis is thus stimulated, and the absorbent vessels encouraged to remove the inflammatory deposit. I have obtained the best results when I have used the battery twice and three times a week. I never use the current strong enough to produce pain. I have had no experience with currents of high tension. A few men have reported marvellous cures made by the use of such currents. I believe obstinate cases should have the benefit of such treatment before

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they are subjected to the use of the knife. I have had no experience in the use of pelvic massage.

In the treatment of the third or suppurative stage of cellulitis we should endeavour to remove the pus at once, or as soon as it can be definitely located. This rule should be followed when the abscess can be reached without endangering the life of the patient. If, however, the pus is far up, and the patient not suffering from its retention, I would advise waiting, with the hope that it might travel to some more favourable point, from which it could be removed with safety. The majority of pelvic abscesses may with safety be opened by the use of a scalpel; some can be more safely reached by the aspiratory needle, and a few can be reached only by abdominal section. After the pus has been evacuated by either of the above means, the cavity of the abscess should be thoroughly and regularly washed out with some antiseptic solution. The strength of the patient must be supported by the judicious use of tonics and nourishment, combined with stimulants and anodynes.

DISCUSSION.

Dr. HENRY O. MARCY, of Boston, Mass., referred to the nature of the pelvic connective tissue. He emphasised the fact that it is not a mere packing, but contains a network of delicate arteries and veins, and, above all, an exquisite plexus of lymphatics. The reader had admitted that pelvic cellulitis occurred where there was some other accident, like an injury to the parturient tract. He thought that the cellulitis must be due to some material infection, probably bacteric. The bacteria need not necessarily come from the uterus. He believed in many of the medicamenta advised for the affection, but regarded them as merely subordinate to the removal of the *de facto* cause, the infection from without, the early removal of which was the best mode of aiding nature to save life.

Dr. E. M. MOORE, of Monroe county, said that in the early days of his medical experience, it was customary to evacuate abscesses by making a valvular incision. Later the aspirator supplanted that mode of treatment. He thought that the aspirator should be regularly employed at first when there was a cavity of pus to be emptied. In his experience, relief immediately followed such treatment. This was owing, he thought, to an osmosis which took place into the emptied cavity. The aspiration might have to be repeated a number of times, and in some cases drainage

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established, but in the latter case the cavity would have become smaller. He recalled a case of abscess in a woman, which he regarded as one of the ovary. At the first aspiration, thirteen pints of pus were removed; at the end of three weeks, three pints more; and two weeks later, one pint and a half. After that there was no necessity for further evacuation: the patient was well. He also remembered another case in which cure followed the seventh evacuation,—the pus being thinner and thinner, until at the last it resembled serum.

As to the cause of the inflammation, he said that the experience of every one must show that it may follow operations on the uterus, even such a simple operation as dilatation with small dilators or sponge tents. Inflammation might extend along the tubes, and he saw no reason why it might not extend through the wall of the uterus itself. Whether a micrococcus was the cause or not he could not say.

Dr. E. D. Ferguson, of Rensselaer county, wished to say one word disagreeing with Dr. Moore. From his remarks we would be led to believe that Dr. Moore would make use of the aspirator as a general if not almost universal rule. He thought that one or two words of objection should be interposed there. The operation of aspiration is so simple, the patients regard it so lightly, and it is often so satisfactory, that it has a field of usefulness; but when we come to the question of pelvic surgery we should have the advantage of definite knowledge of what we propose to do. If we are sure that we can reach a collection of pus through tissues, so that the operation itself does not expose to the hazard of infecting other parts not already infected, aspiration should be used; but if there is any doubt on that point, then an operation, undertaken with more care, with more preparation, and giving more definite knowledge of the structures through which we go, should be selected. In other words, an incision done carefully, so that, as we go down little by little, we know whether we meet parts that should be protected, should be made. In regard to the mere question of emptying the abscess by aspiration or drainage, the results of the recent past would show us no grounds for the belief that there will be any different effect upon the course of the disease, provided in our operative interference we have not added anything to the cavity by our incision or after treatment that we would not have added by our aspiration. If we are as careful to keep that cavity in the same condition by surgical measures, we shall be just as well off, as far as the patient is concerned, by either mode.

Dr. John Cronyn, of Erie county, considered the aspirator of great value in revealing the nature of an abscess or induration. He expressed wonder at the neglect on the part of physicians to recognise the curative effects of opium as compared with morphine. Morphine, in his experience, had not as good an action as opium, which could be used in large

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doses in conjunction with quinine. The latter drug counteracted the poisonous qualities of the opium. Veratrum viride had not yielded good results in his hands.

Dr. ROBB, in closing the discussion, said that Dr. Marcy appeared to have misunderstood him. He did not wish to convey the idea that septicaemia was not one of the principal causes of pelvic cellulitis. Dr. Lusk has shown that over fifty per cent. of the cases are septicaemic. The speaker's object had been to show that there were cases of pelvic cellulitis in which there was very little inflammation of other pelvic organs, but he did not believe that there could be inflammation of one part without the least affection of other parts.

In regard to the use of the aspirator, he had no doubt of its value. He mentioned a case, however, in which he thought the exploratory introduction of the aspirating needle had occasioned the development of pus where none had preëxisted. His own inclination would be to open an abscess freely as soon as it pointed in a suitable position, and to make more direct a tortuous natural opening, resulting from spontaneous rupture, so that the cavity might be cleansed with antiseptic solutions.

He thought medical men differed as much in their estimate of the value of veratrum viride, as in their views concerning the nature of cellulitis. In his hands the drug gave better results in controlling the inflammation than anything else. It lessened the force with which the blood was pumped into the inflamed tissues. His objection to opium was, that some patients could not take it without unpleasant effects. He therefore preferred giving morphine hypodermically where there was abdominal pain.

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ON THE TREATMENT OF ACUTE PERITONITIS BY LAPAROTOMY.

An Informal Discussion by Dr. John Cronyn, of Erie County, and Others.

[From Stenographic Report.]

On the evening of September 25th, there being no subject for discussion before the meeting, Dr. Cronyn volunteered a few remarks relative to the following case, which he reported:

About four months before, a child, while jumping, had in some way injured its abdomen. There was much pain over the bowels, tympanitic distension, vomiting, and purging. The speaker was called about thirty-six hours after the onset of these symptoms, when the existence of peritonitis was very evident. The general condition of the child was not good. It came of a scrofulous family. The venous system over the abdomen was purple, showing an involvement of the abdominal veins. The vomiting and diarrhoea ceased, and after ten days there was evident fluctuation. The case was treated by a very large poultice, with opium and camphor internally. The poultice caused pain; the limbs of the child were drawn up. On the twelfth day he suggested the propriety of opening the abdomen as giving the best chance of saving the child's life. On the fourteenth day he had fears that the child could not survive the day. About half past six that evening he was summoned in great haste. To his surprise and delight he found that an opening had formed at the umbilicus, and an enormous quantity of pus been discharged. The abdominal wall shrank to its normal dimensions, and the child made a speedy and satisfactory recovery, finally reaching a state of health better than ever since the day of its birth.

Could there, the speaker asked, be a plainer proof of the propriety of performing laparotomy in such a case as this? Nature had indicated what ought to have been done, although he feared she had done it better and more safely than he could have done it. The value of laparotomy in the treatment of what was called suppurative peritonitis had been much discussed within the past two years. Many cases had been reported where it had been performed with great success, saving lives that otherwise must have been despaired of; but there had been few such natural proofs of the propriety of the procedure as the case he had described.

Dr. John G. Truax, of New York county, said that three cases of acute peritonitis treated by laparotomy had come within his experience during the last six or eight months. The first was one admitted to his

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wards at the Harlem hospital. The patient was in a state of collapse, too weak to give any history of his condition. He appeared to be about twenty years of age, and of vigorous build. Laparotomy was advised, and performed under antiseptic precautions, the abdominal cavity being washed out. Eight hours later the patient died, never having recovered from the shock.

A few days later a young woman was admitted to the hospital, in nearly the same condition as the foregoing case. Within an hour after her admission laparotomy was performed with the utmost care, and the peritoneal cavity washed out. She died within twelve hours after the operation.

The third case, a man aged thirty, was admitted to the hospital in a state of collapse, following peritonitis of several days' duration. The abdomen was opened, and its cavity thoroughly washed out. The patient appeared to rally after the operation, and hopes of his recovery were entertained; but about twenty-four hours after the operation he became very weak, and, in spite of all efforts to save him, died shortly afterwards.

These cases were all very unfavourable for operation. He thought that if it had been possible to operate before the strength of the patient had been reduced so that the mere shock of the operation was fatal, the results would have been much better. According to his experience, very few cases of acute peritonitis recovered. But he remembered one case that might be of interest: A strong young man had been exposed in bed without covering during a cold night. The next day he was unable to rise, and within twenty-four hours a well marked peritonitis had developed. He was taken to the hospital, and treated with poultices and opiates. After seven or eight days he began to improve, and made a good recovery. Such a case he thought very rare, but could form no estimate of the proportion of cases of acute general peritonitis that survived.

Dr. JANVRIN, of New York county, said that Dr. Cronyn's case was one of great interest, and asked how long the child had been injured before seen by him.

Dr. CRONYN replied that thirty-six hours had elapsed, and that the case was undoubtedly traumatic.

Dr. JANVRIN then inquired as to the condition of the bowels, and, upon Dr. Cronyn's replying that most of the time there was diarrhoea, said that the case appeared to him more like one of supra-peritoneal abscess than of suppurative peritonitis, because the child endured it so well during such a long time, and finally recovered. He thought the condition of the bowels supported this view. The case reminded him of a similar one which had come under his observation, and which he had thought to be suffering from a septic peritonitis. The patient had every symptom of peritonitis,—irritable stomach, a diarrhoeal condition which required checking with opiates, abdominal distension. Abdominal incision

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proved the case to be one of supra-peritoneal abscess. He thought such an abscess might give rise to exactly the same symptoms as a true peritonitis, and might discharge at the navel. In a true peritonitis he thought there would be enough septic absorption to cause death within much less than twelve days.

Dr. LUSK, of New York county, said that it was pretty well settled that supra-peritoneal abscess opened above Poupart's ligament, almost never at the navel. If the experience of the past were of value, discharge at the umbilicus indicated peritonitis. The large circumscribed abscesses so frequent in the past were now rarely met with since antiseptic methods had come into use. In cases of circumscribed abscess, even when the cavity was very large, free incision, with drainage or stuffing with oakum, was followed with rapid granulation and recovery. He inquired whether any other of the gentlemen present had had experience in washing out the abdominal cavity in cases of peritonitis. He had seen it tried in many cases, but they had all died. He did not think the procedure quite rational. He could understand that the treatment might be good in cases where pus had been discharged into the peritoneal cavity before the peritonaeum had had time to take on suppurative inflammation.

Dr. T. H. MANLEY, of New York county, said he had never known a case in which the abdomen had been opened for general peritonitis in which recovery had followed. He had once made an incision for exploratory purposes on a child suffering from peritonitis. Large quantities of foul pus were immediately discharged. He then attempted irrigation, but the child died upon the operating table. He did not think it mattered greatly whether the pus originated outside of or within the peritoneal cavity. The nature of the walls confining it was of much greater moment. Their nature decided the question as to the nature of the purulent collection, whether it were an abscess, a peritonitis, or a cellulitis.

He agreed with Dr. Robb, who had referred, in his paper on pelvic cellulitis, to treatment by constitutional means, that such measures could cure. He had known such cases. Where there was pain, opium gave rest and facilitated recovery. Veratrum viride appeared to have a marked effect on the inflammation by influencing the heart's action, and producing diaphoresis. Where there is syphilis or scrofula, or, when the patient is within a malarial region, the constitutional remedies for those conditions often acted favourably on the suppurative process. In a case of perityphlitic abscess, where he had reason to believe that there was a malarial element present, he had given quinine until cinchonism was produced; and the wound, which had been doing badly, took on a healthy action, and quickly healed.

Dr. CRONYN deprecated the idea that his diagnosis in the case first reported had been a mistaken one. All the evidence had distinctly pointed to a true suppurative peritonitis.

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FORCED RESPIRATION: ADDITIONAL OBSERVATIONS.

By GEORGE E. FELL, M. D., of Erie County.

In the memoir on forced respiration, communicated to the society and published in the last volume of the proceedings (1888, p. 36), all the cases known to that time, with the exception of case No. 2, were reported in detail. The second case took place in Vienna, Austria, under the direction of Professor Boehm, of the Vienna General Hospital.

To complete the literature on the subject to date, I communicated with Dr. Boehm, August 14, 1888, requesting an account of that case. I received from him, November 11, 1888, the following account of the case, which I was pleased to find coincided with my views, previously expressed, as to the value of the operation:

ALLGEMEINES KRANKENHAUS,
VIENNA, Oct. 21, 1888.

Honoured Confrère:

Having just returned to Vienna, I take great pleasure in answering your favour of August 14, 1888.

There has as yet been no authentic report published of the methods which were employed in rescuing Dr. Langer from death by morphia poisoning. I therefore give briefly the important points of the case.

Dr. Langer took, between the 10th and 20th of September, 1887, (nearly two months after Dr. Fell's first operation), six decigrammes (8.24 grains) of morphia dissolved in water. As his servant's attempt to awaken him in the morning was fruitless, a physician from the hospital was immediately called in, and he diagnosed morphia narcotism.

The pulse was very small and intermittent, respiration had nearly ceased—the number about five per minute. The pupils were contracted to the size of a pin's head, and insensible to light; corneal reflex absent; deep coma;—briefly, a typical case of narcotism by morphia.

The attempts to save the patient's life were now made. The stomach was emptied of its contents, and rinsed out with black coffee. This was

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followed by injections of ether. Both of which were followed by apparent good results. After the respirations had increased to seven per minute, the patient was removed to the Royal hospital, at which place artificial respiration was kept up from 8 A. M. until 12:30 P. M. As it was now apparent that artificial respiration was not sufficient to restore normal breathing, tracheotomy was performed. A canula connected with a bellows was introduced, and "forced respiration" (kunstlich Luft eingeblasen) kept up for three or four hours. At 5 P. M. the use of the bellows could be dispensed with, and our attention entirely devoted to watching the natural respiration.

The attempts which the patient made to breathe for himself continued to increase in number, and the next morning he became conscious. Our subsequent treatment consisted in simply caring for the wound, and in elevating and enlivening the much depressed spirits of the patient.

Respectfully,

PROF. DR. BOEHM.

The publicity given the first three cases of forced respiration, and the evident justifiableness of the procedure on account of the wonderful results obtained, warranted the hope that the measure would be utilised for saving human life by the profession generally. The many cases of death from morphia poisoning, reported almost daily through the press, from San Francisco to Portland, Me., in which it has been frequently stated that every means was taken to save life (except forced respiration), and the personal reports of physicians wherein they averred that cases in their charge could have been saved by forced respiration, indicate that physicians will generally fail to be forearmed, even if they have been forewarned. In emergencies it is difficult to obtain proper apparatus, as bellows, valves, etc., with which careful efforts at respiration may be made, so that he who would attempt to save human life by forced respiration must be supplied beforehand with suitable apparatus. In Buffalo my apparatus has always been at the disposal of physicians whom I considered capable of using it. Some have endeavoured to avail themselves of it, others have ignored it, and in a number of instances lost their patients when they might have been saved by forced respiration. In other cases it was not utilised, as the physicians considered their patients beyond the

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hope of any operation. From my experience, having now saved five human lives, which could not have been saved without resort to forced respiration, I must urge that it is difficult to state at what stage preceding death it will not prove valuable. The only safe rule is to make the attempt: you are then placing your patient beyond the question of uncertainty as far as this operation is concerned, and favourable results will take place in the majority of cases. The manufacture of the apparatus by a responsible firm is now, I hope, assured, so that the instrument, in complete condition, may be obtained at reasonable rates.[1]

The addition to my list of cases, which I give below, while not large, clearly demonstrates the advance which forced respiration is over artificial respiration.

CASE No. 7. On the morning of April 26, 1889, Frederick Ryers was found in front of an "opium joint," Broadway, Buffalo, and taken to the "Emergency hospital." His condition was so serious that the house physician sent for me. Evidences of the large quantity of poison taken were cyanosis, absence of reflexes, contraction of pupils, spasmodic respiration doing little good.

Tracheotomy was done. The blood was venous. Forced respiration was kept up, calling the heart into positive action, and causing the return of the pulse at both wrists, and a change from the venous to an arterial state of the blood in the wound in the neck. Reflex action could not be induced; the brain tissue did not respond to the forced respiration, and the pupils continued dilated. The action of the heart kept up for about an hour before final stoppage.

A few days previously I had had at the same hospital a case in which the patient was saved without resort to forced respiration, although the indications were such as almost to warrant the operation. I was preparing to operate, when, a slight improvement being noticed, I desisted, and the patient recovered without requiring tracheotomy. Influenced by this case, I waited too long with Mr. Ryers, until, in fact, the pulse was lost at both wrists, and, on auscultation, no action of the heart could be detected.

CASE No. 8. I was called to attend a case of still-birth, by Dr. Stearnes. It was one of face presentation, in which forceps had been applied. Pressure had ruptured the brain tissue, producing, as was subsequently ascertained, sufficient haemorrhage to prevent resuscitation.

[1] Waite & Bartlett, No. 147 E. 23d St., New York city.

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Previous to my arrival, the nurse had kept up the action of the heart by mouth-to-mouth insufflation. Cyanosis was extreme. As I did not wish to attempt tracheotomy, I, for a time, resorted to the same means. This not giving satisfactory results, the tube connecting with the air control-valve of the apparatus was placed in the mouth of the infant, the nostrils closed, and the lips compressed about the tube, and forced respiration instituted. A change was immediate: cyanosis passed away, the heart action became good and full, the reflexes of the lower limbs were induced, but no change in the brain could be produced. After some four or five hours' work, it was evident that the brain was so injured that it was useless to proceed further, and forced respiration was discontinued.

The value of this case is, that it exemplifies the application of forced respiration without tracheotomy, indicating that in many cases it could be applied through the medium of a suitable mouth-piece, and again illustrating its marked value over artificial respiration, which would have been useless in the case. It was the experience obtained in this case that enabled me to hold the life of my next patient until forced respiration could be systematically applied, and by which it was saved.

CASE No. 9. June 21, 1889, I was called by Dr. J. S. Armstrong, about midnight, to attend Mr. S. F., a grocer, troubled with melancholia. Dr. C. C. Fredericks was called in to assist. The previous evening the patient had taken Tr. Opii, ℥ij. Evidences of approaching death from opium narcosis were present. The patient was placed on the table, and an incision for tracheotomy made. The blood was purple. Dr. Fredericks informed me that the patient was dying, the pupils dilating (dilatation of asphyxia). The tube of the apparatus was placed in the mouth of the patient, the lips tightly compressed about the tube, the nostrils closed, and forced respiration kept up for a short time. The lungs were inflated, the blood in the wound changed to arterial, and the pulse improved slightly. The tracheotomy was then proceeded with, but before its completion, it became again necessary to inflate the lungs through the mouth. On the institution of systematic forced respiration, the cyanosis rapidly passed away, the pulse became stronger, and in about half an hour the patient became conscious. After about eleven hours of forced respiration, auto-respiration was established, and the patient made a good recovery.

No. 10. On October 11th, this same patient took another two ounces of Tr. Opii, together with five to ten grains of morphia. With Dr. Armstrong I performed tracheotomy over the preceding wound, and, after fourteen hours of forced respiration, the patient was again rescued, and made a good recovery, the wound in the neck closing completely in eight days. At this writing, steps have been taken to place him in an institution for the insane.

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Resume of Cases of Forced Respiration to Date.

Case No. 1. Dr. Fell, Buffalo, N. Y. Adult. Morphia, grs. xx, taken. Forced respiration, two and a half hours, saved life.

No. 2. Prof. Dr. Boehm, Vienna, Austria; morphia, grs. 8.24, taken. Forced respiration, for four and one half hours, saved patient.

No. 3. Dr. Fell, Buffalo, N. Y. Adult. Tr. Opii, ℥ ij taken. Forced respiration, for fourteen and one half hours, saved patient.

No. 4. Dr. Fell, Buffalo, N. Y. Adult. Tr. Opii, ℥ ij taken. Anterior jugular vein and trachea cut with razor. Patient almost exsanguinated. Forced respiration, for twenty-four hours, twenty-one and one half continuously, with transfusion of ℥ viii of salt solution, saved life.

No. 5. Dr. Fell, Buffalo, N. Y. Adult, 80 years of age. Tr. Opii, ℥ i, taken. Forced respiration, for twelve and one half hours, failed to save the patient.

No. 6. Dr. Fell, Buffalo, N. Y. Infant eighteen days old. Morphia Sulph., grs. 1, taken. Five hours afterwards forced respiration kept the child alive for four hours.

No. 7. Dr. Fell, Buffalo, N. Y. Adult. Morphia, in large but unknown quantity, taken. Operation undertaken after pulse at wrists was lost; dilatation of asphyxia had taken place, auscultation failed to detect heart action, and blood on tracheotomy was venous. Forced respiration produced return of pulse at both wrists, and clear action of the heart on auscultation. Blood became arterial. Heart ceased beating in about one hour

No. 8. Dr. Fell, Buffalo, N. Y. Still-born infant. Compression of brain prevented forced respiration from proving successful.

No. 9. Dr. Fell, Buffalo, N. Y. Adult. Tr. Opii, ℥ ii, taken. Forced respiration, after eleven hours, saved the patient.

No. 10. Dr. Fell, Buffalo, N. Y. Adult. Morphia, grs. v to x, and Tr. Opii, ℥ ij, taken. Forced respiration, after fourteen hours, saved life.

It might be well to note that where artificial respiration was tried it proved useless. It would have been without avail in any of these cases.

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DIPHTHERIA.

By E. F. Marsh, M. D., of Oswego County.

[Read by title.]

Diphtheria is an acute, specific, infectious, and contagious disease, characterised principally by epithelial changes in, and the exudation of fibrine on and into, mucous membranes and the surfaces of wounds, thereby constituting the so called pseudo-membrane. It was probably first described by Aretius of Cappadocia, and has been known under the various names of ulcus Syriacium, ulcus Ægypticum, garrotillo, morbus suffocans, angina maligna, croup, diphtheritis, and diphtheria. Caelius Aurelianus recognised diphtheria of the pharynx and larynx, as well as diphtheritic paralysis of the soft palate. Ætius, in the fifth century, advised against energetic local treatment, and the forcible detachment of the false membrane until it was ready to fall off spontaneously.

Epidemics occurred in Holland in 1557, in Naples and Sicily in 1563, whence it spread to Constantinople, and was described by Antonio Soglia. In Paris in 1576, and in Spain from 1583 to 1618, there were also epidemics. Mercado tells of a child who gave the disease to his father by biting his hand. Herrara described the disease, in 1515, of both mucous membranes and wounds, and looked upon the false membrane as its essential characteristic. In Italy the disease raged in 1618, and in Portugal in 1626. The former epidemic was characterised by marked contagiousness, depression of vital powers, and weakness of the mental faculties; and an autopsy made in 1642 showed the presence of the false membrane in the larynx.

It first appeared in the New England states in 1659, in the family of Samuel Danforth, of Roxbury, Mass., who had

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twelve children. "One died at the age of six months. The next three being attacked by the malady of bladders in the windpipe, it pleased God to take them all away at once, even in one fortnight's time."

William Douglass says, of an epidemic which occurred in Kingston, N. H., in 1735–'6,—"As this was an inland place of no considerable trade or importance, it was thought to have been of indigenous origin. It continued gradually spreading, seizing here and there particular families with that degree of violence that of the first forty cases none recovered. Some of the patients died of an acute necrosis or mortification, but most of them were carried off by a sympathetic affection of the fauces, neck, or air passages, or by an infiltration and tumefaction of the chops and fore part of the neck, which became so enlarged and turgid as to bring upon a level all parts lying between the chin and sternum, occasioning a strangulation of the patient in a very short time. After a few days it spread from Kingston to the neighbouring townships, but in a milder form. No reason could be given for its greater malignity in Kingston, except perhaps the prevalence of damp places, near large ponds, and fresh water but sluggish streams, like in those localities which produce the rot in sheep."

In a letter written by Dr. Cadwallader Colden to Dr. Fothergill in 1753, he said that "the throat distemper spread" from Kingston westward, gradually, so that it did not reach the Hudson river till near two years later. It followed lines of travel, and, with few exceptions, affected only children and young people, and did not spread equally to all places exposed to the infection. "The poorer sort of people were affected, and those who lived on poor scorbutic diet, and they who lived on low, wet grounds." He described many cases, including one of ten years, who while "the throat distemper was prevailing had sores on her private parts like those on the tonsils of others, but no symptoms of the disorder in her throat."

Home, a Scotchman, in 1765 endeavoured to show the dif-

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ference between croup and angina maligna. Bard, an American, in 1771 described membranous pharyngitis, membranous laryngitis, and membranous pharyngo-laryngitis, and spoke of the membrane affecting the skin, of the paralysis of the muscles of deglutition and of the larynx, and paralysis of of the lower extremities as sequelae. He also said,—"We should remove young children as soon as any one of them is taken with the disease, by which many lives have been, and may again, be preserved."

The modern history of diphtheria may be dated from June 26, 1821, when Brettonneau read his first essay on the subject and gave it the name it now bears, since which time much has been written and said on the subject, and all sorts of treatment recommended: Bleeding, cauterisation, scarification, and antiphlogistics; hydrochloric acid, alum, lunar caustic, blistering, and calomel; sulphate of copper, bicarbonate of soda, tincture of iodine, chlorate of potassium, guaiac, quinine, glycerine, turpentine, sulphur, benzoate of sodium, bichloride of mercury, tincture of iron, fumes of vinegar, tar, salicylic acid, etc.

Etiology. It is a disease of early life. Of five hundred and one cases occurring in Vienna in 1868, only one had reached the age of sixty-two years, and of two hundred and fifty in which Dr. Jacobi had performed tracheotomy, but two were over thirteen years of age. The predisposition to diphtheria in childhood is probably due to the mucous membrane of the pharynx being more succulent and softer, and more frequently the seat of congestive and inflammatory processes. The nasal cavities are small, and frequently the seat of catarrhs; the buccal cavity often the seat of stomatitis, the tonsils preternaturally large, and the larynx not spacious; the lymphatics are relatively larger than in the adult, and communicate more freely.

Family susceptibility is probably next in importance to age as a predisposing cause. Quain relates the case of a family where one child died this year in Paris, a sister died of the same disease two years ago in Florence, and about the

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same date an elder brother similarly died off the Cape of Good Hope: the mother of these children was nearly carried off in childhood by the same disease. Sir William Jenner also says family constitution is "one of the most important elements favouring the development of the disease and determining its progress." Sir Morrell McKenzie also takes this view, and cites several cases as examples.

Social position is also looked upon as a factor by McKenzie, who says that "in its endemic form it rarely attacks those who live in healthy and well ventilated houses, but where it is epidemic it manifests no respect for social rank or wealthy surroundings." Sudden changes of temperature have been looked upon as causes of diphtheria, probably because catarrhal disorders are the most prevalent.

Exhalations from sewers and filth have been claimed as causes; they have also been claimed as the cause of typhoid fever and dysentery. Jacobi speaks of a house in New York city in which three children and a servant were taken sick within a month, two with typhoid fever and two with dysentery. In the same house, in two of the children diphtheritic sore throats were of frequent occurrence.

I wish in this connection to relate a few facts that have come under my observation regarding an outbreak of diphtheria, which occurred at my home in Fulton, N. Y., during the fall and early winter of 1887. The family in which the first cases of diphtheria occurred had a small hennery only five or six feet square; and confined in this small room, which had neither floor, perches, ventilation, nor light, which had a leaky roof, and had not been cleaned out for three years, were kept a number of fowls. One after another of these fowls was taken sick, and several died, one of which, at least, appeared to have choked to death, as the neck was very much swollen. I was not the attending physician of the family, and these facts did not come under my observation until some time after; consequently I had no opportunity to examine those fowls which died. Four cases of diphtheria occurred in this family within the next few days, with

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two deaths, the children who died being those who took most of the care of the fowls. Just south of this house, and distant but thirty or forty feet, lived another family in which occurred three or four cases, none of them being fatal. Upon the east, in an adjoining yard, was a small school-house; and when we learn that the sputa and discharges were thrown out upon the ground without being disinfected, and when we remember that our prevailing winds are from the west, why need we be surprised to learn that numerous other cases occurred in that neighbourhood among the school children, several being fatal, and in one instance three children from one family being buried in about the same number of days?

Dr. Paullinius reports in the *Bulletin Medical* of January 22, 1888, an epidemic occurring in one of the Grecian Islands where no cases had previously existed for thirty years. This island has a population of 4,000 inhabitants, and the epidemic was traced to some turkeys which were brought to the island from Salonica three weeks previously. Two of the turkeys were sick on their arrival, and the others were attacked in succession.

On inspection patches of false membrane were found in the fauces, on detaching which the mucous membrane was seen to bleed slightly. The glands of the neck were swollen, and in one of them the larynx was invaded, as shown by the hoarse cry. The epidemic spread through the entire community, there being a mortality of thirty-six in one hundred cases. Friedberger's report to the Veterinary Society of Munich on Diphtheria of the Domestic Fowl leaves no doubt as to its frequency. Nicati studied an epidemic of diphtheria among hens, which had similar symptoms, and a course very much like that in man. At the meeting of the Second German Congress of International Medicine, held at Wiesbaden, on April 18, 1883, Prof. Gerhardt, of Wurzburg, gave an interesting account of an epidemic of diphtheria among the hens in a village in France. Among 2,500, 1,400 died from diphtheria. One thousand chickens hatched from their eggs died within six weeks. A diphtheritic hen bit a

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hospital attendant, who soon developed diphtheria. Dr. L. Roth, of Kitzengen, observed an epidemic of diphtheria in a flock of hens. It was caused by the slops from a room in which two children had been sick with diphtheria, being thrown upon the dung-heap in the yard where the fowls were kept.

As to the nature of the diphtheritic poison, whether chemical or organic, we must wait for further facts. Bühl was the first to discover the schizomycetae in diphtheritic membrane, and Huter found them in the gray diphtheritic covering of wounds, and in the surrounding blood and healthy tissues; and Huter, Tomasi, and Oertel believed them at the bottom of the diphtheritic process, and constituting the contagious element. On the other hand, Hiller shows that large numbers of micrococci have been found in the cadaver, when death has not been the result of septic disease, and that septic infection is not always severest where bacteria most abound, but where extensive chemical decomposition, or a mass of putrefying tissue is found, which would indicate that the septic process is due to chemical changes rather than to the presence of bacteria.

Pannum, Bergmann, and Schmiedeburg have isolated poisons that contain no bacteria, and Davanie has shown that an infinitely small amount of chemical poison, *free* from bacteria, can kill quickly. The chemical nature of the poison has been emphasised by Pannum, Billroth, C. O. Webber, and Herman. Hiller injected isolated bacteria in large numbers into the subcutaneous cellular tissue, and produced neither abscess nor fever, but only local swelling; and even when injected into his own subcutaneous tissue, they produced only oedema. The bacteria of putrefaction injected into hens' eggs did not cause them to rot; and even Pasteur acknowledges there are elements of putrefaction which are independent of bacteria. Yet Eberth says that without micrococci there can be no diphtheria. Dr. Beale states that "millions of bacteria and other germs are always present upon the dorsum of the tongue, and in the alimentary canal,

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and are present in every part of the body of man and the higher animals, and in all stages of health." I believe that bacteria, while not the essential element of contagion, may and probably do act as carriers of poison.

The nature of the disease, Is it local, or is it constitutional? McKenzie says,—"The most cursory study of the general pathology of diphtheria suffices to assure us that it is an acute general disease, with certain local manifestations. The primary septicaemia is due in the first instance to the specific poison, but absorption from the decomposing lymph is no doubt a cause of secondary infection." The general infection is shown at a very early stage, as well as at a period when the local manifestations have disappeared.

It is well known that diarrhoeas are frequent during the prevalence of cholera, and headache, lassitude, and slight fever are common during an epidemic of typhoid fever, showing that during such epidemics many are more or less under their influence. So, during epidemics of diphtheria, a great many cases of non-membranous inflammation of the throat are observed. The view that most, if not all, cases of diphtheria are constitutional, is supported by the fact that the first complaints of the patient relate to the general condition—the marked prostration of strength, pain in the limbs, lassitude, fever, chilliness, vomiting, or even convulsions. My friend, Dr. C. G. Bacon, a member of this society, as the result of nearly half a century's experience, makes the diagnosis of diphtheritic sore throat from one which is non-diphtheritic hinge on the question of whether the patient has vomited or not. Many cases begin with high fever, and moderate or no local symptoms, and are explained in this way by Jacobi: "The vast ocean of blood in the lungs, with a surface of nearly two thousand square feet, and which contain a fifth part of the entire mass of blood, is separated from the vitiated atmosphere only by the thin epithelial layer of the alveoli of the lungs, by a delicate basement membrane, and by a fine capillary network. In this connection it is immaterial whether diphtheria be ascribed to a parasitic or

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a chemical infection. This would best explain by a saturation of the blood, either direct or catalytic, the symptoms of the disease. In cases accompanied by high fever and slight formation of the membrane, no other explanation would be satisfactory." He also says,—"There are cases in which a local infection of the skin or of a wound may be one of the causes, or the only cause, and there are cases in which the poison in passing through the pharynx gives rise to local phenomena before the system at large gives evidence of infection. But, as a general thing, diphtheria must be looked upon as a constitutional disease, giving rise to local phenomena in the same way as scarlatina does upon the skin, mucous membrane of the alimentary canal, and uriniferous tubules, measles on the skin and respiratory mucous membrane, or typhoid fever on the lymph follicles and mucous membrane of the intestine." In fact, the local symptoms—the false membrane with its parasitic growths—must be looked upon as the first evidence of constitutional poisoning.

Contagion. It seems impossible that any one should doubt the contagiousness of diphtheria. A communication addressed to the Illinois State Medical Society in 1880 bears upon this point. In one school-district an epidemic was started, where no cases had previously existed, by two boys who visited a neighbouring town where there were cases of diphtheria. In a few days both boys had symptoms of a cold, received domestic treatment for their little fever and sore throat, and soon returned to school, where other pupils complained of the odour of their breath. Soon other cases appeared, their being fifty-eight cases with seventeen deaths.

The activity of the poison seems to be in direct proportion to the severity of the case, and inversely as to the size of the room and amount of ventilation. The poison may cling to solid and semi-solid bodies, and be in this way transmitted. It may be communicated by food or drink, and probably can be transmitted through the air, but not for any great distance. Many cases are recorded of physicians becoming infected by membranes expelled during the performance of

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tracheotomy, by sucking mucous from a tracheotomy tube, or by having some of the throat secretions thrown in their faces by the coughing of the patient during examination of the part. It may be communicated by kissing, or from a babe to its mother during the act of nursing. The period of incubation may be from two days to two weeks.

The symptoms of diphtheria are general and local. The general symptoms are those of the general specific disease, of which the local symptoms are the local manifestations. Wherever the false membrane be situated, on the tonsils, or buccal mucous membrane, in the pharynx, larynx, trachea, bronchial tubes, nares, conjunctiva, vulva, vagina, uterus, anus, or on some wound or ulcer, its nature is the same. The general symptom never absent is prostration of strength. This may be so great as to cause the patient to succumb before the false membrane has had time to form. The other general symptoms, more or less frequently absent, are albuminuria, changes of temperature, cutaneous eruptions, enlarged glands, and paralytic affections.

Albuminuria is commonly met with, and does not necessarily indicate a morbid condition of the kidneys; and we do not always find casts and degenerated epithelial cells in the urine. It may occur in mild or severe cases, and is usually first met with on the third or fourth day, thus differing from the albuminuria of scarlet-fever, which does not usually appear until the second week. It may disappear in a few days, or may, as in a case which I saw, last for some weeks, and finally pass into almost entire suppression of urine, with general anasarca. Its probable and most usual cause is the rapid waste of tissue and the altered state of the blood, which are early effects of the poison of diphtheria, and which call for an enormous discharge of effete matter by the kidneys; or it may be due to preëxisting nephritis, or to a simple congestion of the kidneys resulting from extra work and their functional feebleness. Albuminuria is not of itself a sign of danger, and its prognostic significance belongs not to itself, but to its cause.

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High temperature, although not usual, indicates danger, but a moderate temperature may be met with in rapidly fatal cases.

Cutaneous eruptions, varying much in appearance, are sometimes seen, are visible for from a few hours to three days, and are sometimes vesicular, sometimes resemble urticaria, or may occur in rubeolar or erythematous patches. Such eruptions are most commonly situated on the neck and chest, but may make their appearance upon the face, abdomen, or thighs, and do not influence the prognosis. But ecchymoses due to blood poisoning may occur, and are of serious import.

Enlarged glands are commonly present, and are not due to local infection, but to the general disease itself. Those most commonly involved are the sub-maxillary and cervical glands. An exception to this occurs when the false membrane is confined to the tonsils or vocal cords, and is explained by the absence of lymphatics in those parts.

Various paralyses may and often do occur in connection with or as sequelae to diphtheria, and may attack any part or organ. The question of central or peripheral origin of these paralyses is still *sub judice*. Probably many sudden deaths from diphtheria of patients apparently doing well or convalescent are due to cardiac paralysis.

The local symptom, which is invariably present (unless the patient have been cut off by the intensity of the poison before the membrane has had time to form), is the formation of false membrane. This is characterised by the exudation in various situations, particularly on the mucous membrane of the soft palate, uvula, tonsils, pharynx, larynx, and trachea, of a peculiar cacoplastic lymph, which, together with epithelial cells and mucus, generally forms a thick, tough, stratified pellicle, or false membrane. This is accompanied by a certain amount of infiltration of the surface and deeper tissue, which causes swelling, and may, if abundant, give rise to necrosis of the tissue. It is generally of a grayish white colour; but under the influence of the atmosphere and foreign substances, and admixture of blood, may become yellowish or brownish, and the odour of it and the surrounding parts

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become sweetish and musty, or so fetid as to contaminate the air of the room. This deposit is surrounded by a *distinctly localised* redness.

The subjective symptoms depend upon the location of the false membrane and the amount of infiltration of the underlying tissues. If the disease is tonsillar or pharyngeal, then we have more or less dysphagia; and while breathing may not be difficult, yet there would be an altered tone of voice. If the larynx be invaded, there would be aphonia, dyspnoea, etc.

The prognosis also depends upon the location of the false membrane. Tonsillar diphtheria is the least fatal, laryngeal diphtheria the most fatal. The character of the epidemic, the surroundings, and previous physical condition, as well as the age of the patient, also influence the prognosis. Other conditions being equal, the younger the subject the less the chances of recovery. This arises from the smaller resisting power to depressing influences, and the narrowness of the larynx in infancy and childhood. The thickness and extent of the exudation also influence the result.

Treatment. The symptoms are, as I have endeavoured to show, due partly to a general blood infection, and partly to the local manifestations. Each is attended by its own special danger. As regards the general condition, it is the *intensity* of the morbid changes which constitutes the great danger. Locally, the risk lies in the *occurrence of the exudation in a perilous situation.* Thus the treatment would be naturally divided into *general* and *local*, and, I might add, hygienic.

The general treatment should be directed toward husbanding and supporting the patient's strength by every available means.

The temperature of the room should be moderate, the air moist, and the food should be at once nutritious, digestible, and easily taken. Large quantities of water should be taken to increase the secretions from the mucous membranes, and assist in macerating and separating the false membrane. Internal medicinal treatment should consist of the tincture

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of iron in moderate doses, frequently repeated, in combination with potassium chlorate and glycerine. Regarding the use of potassium chlorate, Jacobi sounds a note of warning against its administration in large doses, and says it "has proved dangerous and fatal in a number of instances, producing one of the most dangerous diseases, acute nephritis."

Quinine is also of value, and whiskey should be used on the least sign of cardiac weakness or syncope.

Local treatment should consist of frequent cleansing of the parts, and removal of the decomposing material. A disinfectant should be used by gargling, if the pharynx, uvula, soft palate, tonsils, or buccal cavity are affected; or the solution may be used by means of a mop, and by an atomiser if the disease has extended to the nares, larynx, trachea, or bronchi. For this purpose a solution of chlorine, made by dissolving an equal number of grains of potassium chlorate and minims of hydrochloric acid in water, is the most efficient and satisfactory disinfectant which I have yet used. This should be used at least every thirty minutes during the waking hours of the patient. Moist heat is, I believe, an agent of much value in any stage of the disease if used persistently and thoroughly. For this purpose steamed flannel cloths should be applied, not around the neck, but under the chin, enveloping the anterior part of the throat, and extending up over the tonsils and to the ear upon either side, and held in place by another cloth tied or pinned over the top of the head. These steamed cloths should be changed at least twice every hour until improvement takes place. Inhalations of steam also exercise a favourable influence over the local process.

Preventive and hygienic treatment should consist of isolation, ventilation, disinfection, cleanliness, and bringing the entire discipline of the house, school, and social intercourse into such channels as shall prevent the spread of an epidemic.

Diphtheritic paralyses require good and careful feeding, iron, strychnine, with perhaps electricity, friction, and hot bathing.

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PROCEEDINGS.

SIXTH ANNUAL MEETING

OF THE

NEW YORK STATE MEDICAL ASSOCIATION,

HELD AT THE HOTEL BRUNSWICK, FIFTH AVENUE AND 27TH STREET, NEW YORK CITY, SEPT. 25, 26, and 27, 1889.

FIRST DAY, WEDNESDAY, SEPT. 25, 1889.—MORNING SESSION.

The meeting was called to order at 10 o'clock A. M., by the PRESIDENT, Dr. WM. T. LUSK, of New York.

The report of the Committee of Arrangements was presented by Dr. JOHN G. TRUAX, Chairman.

Upon motion of Dr. FERGUSON, the report of the Committee was accepted and adopted.

The Annual Report of the Council was read by the SECRETARY, Dr. E. D. FERGUSON.

Upon motion of Dr. CARROLL, the report of the Council was accepted and adopted.

Upon the suggestion of the SECRETARY, the report of the TREASURER was put over one day, as he was engaged in the registration.

The SECRETARY stated that there were no special committees to report at this time, and no unfinished business to come before the meeting.

The SECRETARY announced that the PRESIDENT had appointed the following Committee on Scientific Contributions:

Dr. DOUGLAS AYRES, First District.
Dr. GEO. E. LYON, Second District.
Dr. C. W. BROWN, Third District.
Dr. B. L. HOVEY, Fourth District.
Dr. E. H. SQUIBB, Fifth District.

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The SECRETARY presented the annual reports of the Branch Associations and of the New York County Association, and moved that they be referred to the Committee on Publication.

Motion carried.

The SECRETARY offered the following amendment to the by-laws, referred to in the report of the Council:

In case of sickness or financial misfortune, the Council may remit, or otherwise settle, arrearages of dues when it is probable the Fellow will be able to continue payments in the future.

This amendment to be added to section 1, article VI, of the by-laws.

Upon motion, the power asked for was conferred upon the Council for the current year by unanimous vote.

A recess was taken for the appointment, by the District Branches, of the Nominating Committee.

The SECRETARY reported the appointment of the following Nominating Committee:

First District, Dr. WM. H. BIGGAM, Dr. EZRA GRAVES.
Second District, Dr. L. C. DODGE, Dr. GEO. E. LYON.
Third District, Dr. J. K. LEE, Dr. W. B. MORROW.
Fourth District, Dr. JOHN CRONYN, Dr. B. L. HOVEY.
Fifth District, Dr. A. L. CARROLL, Dr. T. H. MANLEY.
At large, Dr. S. S. PURPLE.

AFTERNOON SESSION.

The meeting was called to order at 1:30 o'clock P. M., by VICE-PRESIDENT STRONG.

Dr. FERGUSON stated that at the last meeting of the American Medical Association resolutions were presented, advocating a uniform system of preparatory education in the study of medicine. These resolutions were to be presented to the various state organisations. He suggested that a committee of three be appointed to take into consideration those resolutions when presented, and report at the next meeting of the Association.

Upon motion, it was voted that a committee of three be appointed to so act.

The evening session was devoted to the reading and discussion of papers.

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SECOND DAY, THURSDAY, SEPT. 26, 1889.—MORNING SESSION.

The meeting was called to order at 10 o'clock A. M., by VICE-PRESIDENT STRONG.

The report of the Council was read by the SECRETARY, Dr. E. D. FERGUSON.

Dr. FERGUSON presented the report of the TREASURER, and moved that it be referred to an auditing committee for report.

Motion carried.

Upon motion of Dr. FERGUSON, the thanks of the Association were extended to Dr. T. D. CROTHERS for his paper.

Dr. FERGUSON announced that the chairman had appointed, as committee to examine the accounts of the TREASURER, Drs. E. M. MOORE, J. K. LEANING, and F. D. VANDERHOOF.

The TREASURER'S report was as follows:

TREASURER'S REPORT.

New York State Medical Association,

In account with JOHN H. HINTON, *Treasurer.*

From Oct. 10, 1888, to Sept. 25, 1889.

Dr.

To amount paid		
Dr. E. D. Ferguson for stenographer, postage, etc.,	$150.37	
Angell's printing-office,	64.88	
C. G. Crawford, printer,	7.25	
Dr. C. E. Denison, sec'y Com. of Arrangements,	10.49	
Dr. E. S. Arnold, acting librarian,	12.03	
For supper at Brunswick Hotel,	120.00	
Dr. R. W. St. Clair, refunded dues,	3.00	
Telegram and Express,	2.00	
John Cornelisse, for collecting $76,	7.60	
J. H. Vail & Co., for distributing volumes,	63.67	
Republican Press Association, for Vol. 5,	1,470.96	
		$1,912.25

Cr.

403½ dues, for periods from one to five years,	$1,210.00
97 annual dues, at five dollars each,	485.00
Account of dues for 1889,	10.00
Dr. S. B. Collins, dues for 1889 and 1890,	10.00
Assessments,	52.00

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Initiation fees for 30 Fellows, ...	$150.00	
Sale of volumes, ...	17.50	
Balance of Collation fund for 1888 from subscriptions, ...	107.00	
Balance brought forward, Oct. 10, 1888, ...	148.45	
		$2,189.95
		1,912.25
Balance general fund, Sept. 25, 1889, ...		$277.70
Building Fund, interest not added, ...		465.00
Library bequest, from the estate of Wm. C. Pryer, M. D.,		2,000.00
		$2,742.70

Respectfully submitted,

JOHN H. HINTON, M. D., *Treasurer.*

Your committee, appointed to audit the accounts of the TREASURER, report that they have compared the statement of bills with the vouchers for the same, and have found it correct.

E. M. MOORE.
J. K. LEANING.
F. D. VANDERHOOF.

AFTERNOON SESSION.

The meeting was called to order at 1:40 o'clock P. M., by VICE-PRESIDENT STRONG.

DR. FERGUSON announced that the PRESIDENT had appointed, as Committee on Preliminary Medical Education, Drs. AUSTIN FLINT, H. D. DIDAMA, and JOHN CRONYN.

THIRD DAY, FRIDAY, SEPT. 27, 1889.—MORNING SESSION.

The meeting was called to order at 10 o'clock A. M., by VICE-PRESIDENT STRONG.

The SECRETARY presented the report of the Nominating Committee in favour of the following officers:

President: Dr. J. G. ORTON, Third District.

Vice-Presidents:

First District, Dr. DOUGLAS AYRES.
Second District, Dr. M. H. BURTON.
Fourth District, Dr. E. MOTT MOORE, JR.
Fifth District, Dr. WM. B. EAGER.

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Members of the Council:

First District, Dr. C. M. KLOCK (1890), Dr. W. H. BIGGAM (1891).
Second District, Dr. THOMAS WILSON.
Third District, Dr. H. O. JEWETT.
Fourth District, Dr. S. T. CLARK.
Fifth District, Dr. J. G. TRUAX.

Director of the Library: Dr. J. W. S. GOULEY.
Treasurer: Dr. J. H. HINTON.
Secretary: Dr. E. D. FERGUSON.

Upon motion of Dr. CARROLL, it was voted that the SECRETARY cast an affirmative ballot for the list of officers as read.

The ballot was so cast, and the officers declared duly elected.

The SECRETARY presented the report of the committee appointed to examine the accounts of the treasurer,—that they had compared the statement of bills with the vouchers of same, and found them to be correct.

Upon motion of Dr. FERGUSON, the report of the committee was accepted and adopted.

The afternoon session was devoted to the reading and discussion of papers.

Upon motion of Dr. FERGUSON, it was voted that the Sixth Annual Meeting of the Association be adjourned.

E. D. FERGUSON, *Secretary.*

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REPORTS OF THE DISTRICT BRANCHES.

FIRST DISTRICT BRANCH.

The fifth annual meeting was held at the Arlington Hotel, Rome, Oneida County, on Tuesday, July 2, 1889.

The meeting was called to order at 11 o'clock A. M.

Twenty-three Fellows and invited guests were in attendance.

The minutes of the last meeting were read by the Secretary, and, on motion, were adopted.

The report of the Committee of Arrangements, stating the provisions for the meeting, was received and adopted.

The President then delivered his address,—the title being "Food." The subject was considered from several stand-points: as the chemistry of food, its elements, and their sources of supply; a comparative estimate of the nutritive value of various articles of food; suggestions as to the selection of the most nutritious and economical articles of food; notes on the most wholesome and cheapest diet for labouring people; and a consideration of diet in sickness, and especially in wasting diseases.

There was no report of delegates, nor of the Executive Committee.

The Treasurer then reported as follows:

There was no assessment made in 1888,—there being a surplus of ten dollars in the treasury at the annual meeting for that year. The Treasurer also begged leave to report that out of a membership of ninety-six, in this Branch, thirty-four had neglected to pay an assessment of one dollar, made at the regular meeting in 1887, although several appeals had been made to each delinquent. Oneida County furnishes twenty-one of the delinquents out of a membership of forty-four, and a large majority of them are residents of Utica.

There was expended for the Branch since last report $20.50, as follows:

Expenses for guests at Hotel Warner, July 10, 1888, . .	$5.00	
Stationery, ...	3.50	
Circular notices and postage, ...	5.20	
Programmes for this meeting, ...	5.00	
Postage on programmes, ...	1.80	
		$20.50
Less cash from last report, ...		10.00
Balance due the Treasurer, ...		$10.50

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The Treasurer presented his books and vouchers, and, upon motion, his report was approved, and his account declared audited.

It was then resolved that an assessment of one dollar be levied upon each member of the Branch, to pay the present indebtedness, and to provide funds for the current year, and that the Secretary be instructed to collect the same.

The Nominating Committee was then appointed.

The following papers were then read:

"Lead Poisoning," by Dr. Geo. G. Phelps, of Oneida County.

"The Responsibility of Criminal Inebriates," by Dr. T. D. Crothers, of Hartford, Conn.

"Diphtheria," by Dr. E. F. Marsh, of Oswego County.

By resolution, Dr. Marsh was requested to publish his paper.

An adjournment of one hour for dinner was then voted.

The afternoon session was opened promptly on time, by the President, and the first business was a paper, by Dr. Robert Newman, of New York city, on "Electrolysis in Gynecology." The paper was very interesting and valuable, and illustrated the various effects of electrical currents, and indicated the use of electricity in gynecology.

Dr. Charles P. Russell, of Oneida County, then read a paper on "Eczema, Considered from a Clinical and Therapeutical Stand-point." The paper was well received, and elicited considerable comment and discussion.

The Nominating Committee then reported the following nominations for the Executive Committee:

William Gillis,	Franklin County.
Isaac de Zouche,	Fulton County.
Thomas McGann,	Hamilton County.
W. D. Garlock,	Herkimer County.
J. Mortimer Crawe,	Jefferson County.
Albert A. Joslin,	Lewis County.
H. M. Leach,	Montgomery County.
G. Alder Blumer,	Oneida County.
E. F. Marsh,	Oswego County.
Guy Reuben Cook,	St. Lawrence County.

The report was accepted and adopted.

On motion, the Association adjourned to meet at the regular time in 1890, at such place as the Executive Committee shall designate.

S. H. FRENCH, *President.*
EZRA GRAVES, *Secretary.*

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SECOND DISTRICT BRANCH.

The fifth annual meeting of the Second District Branch was held in Saratoga Springs, N. Y., June 18, 1889.

The meeting was called to order by the President, R. C. McEwen, at 11 o'clock A. M., twenty-five members and delegates being present.

The minutes of the last meeting were read and adopted.

The report of the Committee of Arrangements, providing for a morning and afternoon session, was presented and approved.

The President delivered his annual address, which was received with the hearty applause of the meeting.

On motion of Dr. Ferguson, the thanks of the Association were given the President for the address.

The Treasurer's report was read and adopted. This showed a balance on hand of $7.79.

Dr. Charles Hammer read a paper on "Cystitis." He favoured, in some cases, bleeding and purgatives. He related a case of catarrh of the bladder treated by chloroform anaesthesia, use of catheter, aspiration with Van Buren's rubber bag, and injection of a six per cent. solution of tannin. In women he corrects uterine displacements, if present, gives alkalies, and finds boracic acid, as a local application, of benefit. He does not think pichi any more useful than copaiba.

Discussed by Drs. Van Vranken, Finder, and Ferguson. The latter recommends, among other things, antipyrine, or, preferably, phenacitrin, as this relieves pain and is not attended with any danger of forming a habit of using the drug. He referred to the necessity, in some cases in women, of forming a vesico-vaginal fistula, and the use of catgut suture (as not so liable to be attended with phosphatic deposit), and careful search for bands within the bladder, which make pockets for the retention of urine.

The third paper was presented by Dr. Mitchell, of Troy, on "A Case of Lupus Exudens of the Orbit and Face." A farmer, in June, 1863, while a prisoner of war, had a small sore below the right eye which, in the two years following, had made no progress. In 1877 it was extending, and was then treated with arsenical paste. In 1882 the whole lower lid was eaten away, and was then treated with electricity, followed by caustics. In 1884 he was treated by a "cancer doctor," but the disease slowly progressed for three years more, when the whole orbit was filled with an ulcerating mass. The patient was in feeble condition. In 1887 Dr. Mitchell removed all of the diseased parts, including the whole lower part of the bony orbit, extending into the antrum. The freshened sur-

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face was covered with a paste of chloride of zinc, and packed with iodoform gauze. The operation was done with antiseptic precautions, and the patient recovered without any bad symptoms. Two years after, a small ulcer, appearing on the site of the former sore, was removed with the knife, and caustic applied, since which time he has remained well. He thinks that vigourous measures were the only means worthy of use in this case. In reply to a question by Dr. Ferguson, he stated that he preferred zinc chloride to arsenical paste, for, though the latter attacked the diseased portions, it might be followed by severe constitutional symptoms.

Dr. Ferguson took issue with the author of the paper on the statement that arsenical paste is selective. He believes that the flesh is left in better condition after the use of the zinc, and that the resulting scar is smaller.

Dr. Ferguson read a memoir of R. H. Sabin, M. D., which was referred to the Committee on Necrology for publication in the state transactions.

Dr. Ferguson related a case, and presented the specimen, of obstruction of the bowels, in which the coils of intestines were apparent through the walls of the abdomen, this symptom being pathognomonic in chronic obstruction of the bowels. In this case the difficulty had lasted a long time; constipation and diarrhoea had alternated for a long period. At the autopsy the immediate cause of the fatal termination of the case was found to be a plum pit which had entirely closed the constricted part in the descending colon. This acted as a valve, and rupture of the gut took place above the obstruction; collapse ensued, and the patient died with a very moderate degree of pain. The speaker suggested that in cases where operative procedures were necessary, incision should be made in the median line, even when it will become necessary to make an artificial anus. A second operation, when the patient sufficiently recovered, could then be made for relief of stricture.

Dr. Ferguson also showed a specimen of multilocular ovarian tumour removed by him a year ago. The patient's twin sister had a similar growth removed by him a year before. Also a second ovarian tumour, recently removed, showing cysto-sarcoma high up on the wall of the sac.

On motion of Dr. Hammer, the thanks of the Association were given Dr. Ferguson for his instructive address.

The meeting adjourned for dinner, and at 3:30 o'clock P. M. was called to order.

On motion, the President was requested to appoint a Nominating Committee to recommend officers for the ensuing year.

Dr. Sabin, of Albany County,
Dr. Ferguson, of Rensselaer County,
Dr. Ferguson, of Warren County,
Dr. Hall, of Saratoga County,
Dr. Van Zandt, of Schenectady County,

were named for the committee.

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A recess was then taken, and the Association were entertained at a dinner at the American House, provided by the Fellows resident in Saratoga Springs.

On reassembling for the afternoon session, Dr. J. P. Marsh read a paper on a case of foreign body in the orbit. The specimen was removed after being carried by the patient for sixteen months without notable symptoms. Detachment of a portion of the retina had been diagnosticated at the time of the accident, and, though examined by the speaker and two other physicians soon after the reception of the injury, no foreign body was found. The specimen was a piece of steel, weighing fifty-one grains and measuring nine sixteenths of an inch in its greatest length and five sixteenths in its greatest width.

The Nominating Committee reported the following Executive Committee, the report being accepted and adopted:

Albany County,	Dr. W. B. Sabin.
Clinton County,	Dr. E. M. Lyon.
Columbia County,	Dr. J. W. Lockwood.
Essex County,	Dr. Lyman Barton.
Greene County,	Dr. A. H. Getty.
Rensselaer County,	Dr. J. P. Marsh.
Saratoga County,	Dr. M. N. Babcock.
Schenectady County,	Dr. Charles Hammer.
Schoharie County,	Dr. Wm. Hagadorn.
Warren County,	Dr. G. R. Martine.
Washington County,	Dr. A. J. Long.

It was then resolved that the sixth annual meeting should be held at Catskill, on the fourth Tuesday in June, 1890.

Dr. Ferguson then moved a vote of thanks to the Fellows resident at Saratoga Springs for the convenient accommodations and hospitable entertainment during the meeting.

On motion, the Association then adjourned.

R. C. McEWEN, *President.*
C. H. BURBECK, *Secretary.*

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THIRD DISTRICT BRANCH.

The fifth annual meeting was held at Cortland, Thursday, June 6, 1889.

The meeting was called to order at 10 o'clock A. M., and, after hearing the report of the Executive Committee, Nominating Committee, and Committee of Arrangements, proceeded at once to listen to the scientific papers.

Dr. Elias Lester, President of the district branch, presided.

The President presented his address, giving interesting details of cases of deception and malingering on the part of patients for personal motives.

Dr. F. W. Higgins presented a paper entitled "Time Element in Office Practice," in which he contended that the ordinary compensations of office work were insufficient. He believed that the profession should stand together, and bring such charges up to a standard consistent with the labour performed.

Dr. L. J. Brooks presented a memorial sketch of the late Dr. Geo. W. Avery, of Norwich. A motion was made and carried, requesting that it be sent to the State Association for publication in the State Transactions.

Dr. Ely Van de Warker, of Syracuse, presented a paper on "Diseased Ovaries and Tubes, with Specimens," which was of exceptional interest.

Dr. B. A. Church presented the next paper entitled "Reflex Neurosis." He demonstrated that pain frequently had its origin at a considerable distance from its apparent location, and gave details of interesting cases where a thorough search demonstrated such distant origin, and appropriate treatment resulted in cure of cases otherwise intractable.

Dr. S. M. Hand, of Norwich, presented an elaborate paper on the value of "Brain Localization in the Diagnosis and Treatment of Brain Diseases and Injuries." The paper consisted of a close study of the various functions of different portions of the brain and spinal cord, and the indications that demonstrated central injuries and diseases. Also a study of the external topography of the brain and skull, and rules for locating the portions of the brain lying underneath. He also described the diseases and injuries that were capable of being relieved by operative procedures.

This paper was discussed by Dr. Nathan Jacobson.

Dr. Chas. W. Brown, of Elmira, presented a paper full of practical suggestions concerning "Surgical Dressings," particularly as adapted to railroad injuries. He advocated, as the first principle of success, absolute cleanliness of the injured part, and that it be put in as thoroughly

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aseptic a condition as possible. He urged against the use of the ordinary coarse dressings, and also against placing absorbent cotton immediately in contact with wounds,—the lint being much to be preferred, and more easily removed. He recommended for ligatures the "silk-worm gut," and suggested as a dressing a mixture of carbolic acid, oil of eucalyptus, and linseed-oil.

Dr. L. J. Brooks, of Norwich, presented a paper on "Suggestions for the Applications of Starch, Glue, and Paper Dressings." In making "jackets" for spinal curvatures and deformities, he first made a plaster jacket, and used this as a mould from which a cast of the body was made. Over this cast he applied a layer of flannel, and over this alternating layers of paper and either starch, strengthened with a small portion of oxide of zinc, or of a mixture of white glue (2 oz.), oxide of zinc (4 oz.), and water (16 oz.). He also showed a method of lacing, by making lapels on each side of the centre of the jacket.

Dr. Florence O. Donohue, of Syracuse, read a paper on the "Management of Placenta Previa," in which he advocated turning and delivering in all cases.

The paper was vigourously discussed by Drs. Douglas, Chittenden, Brooks, and others.

Dr. Caleb Green exhibited a specimen of a human monstrosity.

The Nominating Committee reported as follows:

Executive Committee:

Cortland County,	F. W. Higgins.
Onondaga County,	F. O. Donohue.
Chemung County,	C. L. Squires.
Broome County,	J. H. Chittenden.
Delaware County,	W. B. Morrow.
Chenango County,	L. J. Brooks.
Cayuga County,	W. R. Laird.
Schuyler County,	B. T. Smelzer.
Seneca County,	F. G. Seaman.
Otsego County,	B. A. Church.
Tompkins County,	Wm. Fitch.
Tioga County,	W. L. Ayer.

As Secretary: Nathan Jacobson.

They presented the following resolution:

Resolved, That the Association appreciate the special efforts of the Secretary, L. J. Brooks, in behalf of the society, and that he is relieved from further duties as secretary only upon his own urgent request.

It was recommended that the next meeting be held at Syracuse, in 1890.

Adjourned.

ELIAS LESTER, *President.*
NATHAN JACOBSON, *Secretary.*

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MEETING OF THE EXECUTIVE COMMITTEE OF THE THIRD DISTRICT BRANCH.

Meeting held at Syracuse, March 15, 1889, at the office of Dr. H. L. Elsner.

Present: H. L. Elsner, Elias Lester, F. B. Seaman, F. W. Higgins, and Leroy J. Brooks.

Communications were read from various members of the Executive Committee, regretting absence.

The Secretary read communications from several members of the Association in reference to the publication of papers, and, after a full discussion, the following resolution was adopted:

Resolved, That, while the papers prepared for the Association shall be considered the property of the Association, and that to the Association shall belong the first right of publication, if arrangements are not completed for such publication, as a part of the Association's transactions, at the time the paper is read, the author can then be at liberty to select his own publisher, at his own expense.

A communication was read, from the Philadelphia *Medical Times*, offering to print the transactions and papers,—furnishing reprints for those desiring them,—providing the Association, as a body, would subscribe for the journal at one dollar per year (regular subscription price, two dollars).

It was ordered that slips be sent to each member calling for the subscription, and, if sufficient number were obtained to justify the action, to to make arrangements for publication.

The meeting was appointed for the second Thursday of June, at Cortland.

Drs. F. W. Higgins, Caleb Green, H. C. Hendricks, H. O. Jewett, and M. L. Halbert were appointed as Committee of Arrangements.

Adjourned, to meet at Cortland, Wednesday evening, June 5, 1889.

Meeting of the Executive Committee, Wednesday, June 5, 1889, at the office of F. W. Higgins, at Cortland.

Present: Dr. Elias Lester, Dr. F. W. Higgins, Dr. Clark W. Greene, Dr. B. A. Church, and Dr. Leroy J. Brooks.

Communications were read from the various medical journals concerning the publication of the transactions of the Association, in which they desired, before agreeing to publish such papers, to have the Association, as a body, subscribe to the journals.

The Philadelphia *Medical Times* withdrew their former offer, and submitted another, which, it was agreed, should be submitted to the general session.

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A proposition for printing transactions was also made by the Chenango Union Printing-office—offering to print the transactions and papers for seventy-five cents a page, and the reprints for fifty cents a page.

Bills for printing, aggregating nine dollars and twenty-five cents, were ordered to be paid; also Secretary, for stamps and paper, five dollars; also for stenographer, twenty dollars.

The Secretary reported that thirteen members had responded to the call for subscriptions to the Philadelphia *Medical Times*.

A motion was made and carried, that, unless otherwise ordered by the society, the money received for said subscriptions be returned to those sending them.

LEROY J. BROOKS, *Secretary.*

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FOURTH DISTRICT BRANCH.

The fifth annual meeting was held in the common council chamber, Rochester, May 14, 1889.

The meeting was called to order at 11 o'clock A. M., by President Strong, of Westfield.

The minutes of the last meeting were read and approved.

The President appointed Drs. Stockton and Bemis to act with the Secretary as Registration Committee.

Dr. A. H. Briggs reported, for the Committee of Arrangements, that the committee laboured under some embarrassment because of the short time they had to communicate with members in reference to titles of papers, and suggested that next year the committee be appointed earlier,—if possible, at this meeting,—so that the committee might know what to expect in the way of papers.

President Strong stated that the matter would be brought to the attention of the Executive Committee, and acted upon during the day.

The annual address was then delivered by President Strong, upon "The Advancement of Medical Education."

The Treasurer presented his annual report as follows:

Receipts.

Balance of funds, 1887–'88,	$16.73	
57 assessments,	28.50	
		$45.23

Expenditures.

Postage,	$5.85	
Printing,	5.00	
		$10.85
Balance on hand,		$34.38

Your Treasurer would respectfully recommend that no assessment be levied upon the members of the Branch this year.

WM. H. THORNTON, *Treasurer.*

Upon motion of Dr. Hovey, it was voted that the report of the Treasurer be accepted, and the recommendation adopted.

Dr. E. Moore spoke of how little had been done by the Fellows towards increasing the membership of the Branch, and moved the

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appointment of a committee, of one or more in each county, to take charge of the matter of canvassing the counties with reference to increasing the membership.

Motion carried.

Dr. F. F. Hoyer spoke of a novel method of examining the lungs, using the ordinary stethoscope.

A recess of ten minutes was taken, during which the following Nominating Committee was appointed:

Chautauqua County,	Dr. N. G. Richmond.
Erie County,	Dr. A. H. Briggs.
Livingston County,	Dr. R. J. Menzie.
Monroe County,	Dr. B. L. Hovey.
Orleans County,	Dr. J. H. Taylor.
Wayne County,	Dr. Darwin Colvin.
Wyoming County,	Dr. A. G. Ellinwood.

Dr. Hubbell moved that when we adjourn we adjourn to 1:30 o'clock.

Motion carried.

Dr. E. M. Moore read a paper upon "Tetanus Following Ovariotomy."

The paper was discussed at length by Drs. Tremaine, Lynde, Hovey, Eddy, and Fell.

The President declared a recess until 1:30 o'clock.

AFTERNOON SESSION.

After the meeting was called to order, the Nominating Committee reported in favour of the following members of the Executive Committee:

Alleghany County,	Dr. B. C. Wakely.
Cattaraugus County,	Dr. V. A. Ellsworth.
Chautauqua County,	Dr. Wm. Chace.
Erie County,	Dr. C. G. Stockton.
Genesee County,	Dr. M. W. Townsend.
Livingston County,	Dr. J. P. Brown.
Monroe County,	Dr. Richard M. Moore.
Niagara County,	Dr. S. T. Clark.
Ontario County,	Dr. F. D. Vanderhoof.
Orleans, County,	Dr. John H. Taylor.
Steuben County,	Dr. N. M. Perry.
Wayne County,	Dr. J. N. Arnold.
Wyoming County,	Dr. A. G. Ellinwood.
Yates County,	Dr. D. M. Smith.

The report of the Nominating Committee was accepted and adopted.

Dr. A. H. Briggs moved that the Committee on Membership be composed of one from each county excepting Erie and Monroe, and that there be five members for Erie and three for Monroe.

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Dr. Bemis moved that every member of the Branch be furnished with a copy of the Code of Ethics, and that the Secretary be authorized to purchase a sufficient number for distribution to members of the Branch.

Motion carried.

Dr. C. G. Stockton, of Erie County, read a paper on "The Nature of Croupous Inflamation, with Especial Reference to the Puerperium."

Dr. U. C. Lynde, of Erie County, read a paper on "Observations on Dislocation of the Hip."

Dr. E. M. Moore, Jr., of Monroe County, presented and explained a series of photographs, showing a dislocation of the hip.

Upon motion, the meeting adjourned.

WILLIAM H. THORNTON, *Secretary.*
THOMAS D. STONG, *President.*

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FIFTH DISTRICT BRANCH.

The fifth annual meeting of this Branch was held in Brooklyn, in the Magnolia lodge rooms, on Tuesday, May 28, 1889.

The morning session was called to order by the President, Dr. W. T. Lusk, at 11:30 o'clock A. M.

The Secretary read the minutes of the last meeting, which were approved.

The Secretary announced that Drs. W. D. Woodend and C. S. Wood had been appointed to act with the Secretary as Registration Committee.

The President then read his annual address. The interest in the cases mentioned in this very valuable paper was markedly increased by having the morbid specimens of the affected parts themselves for inspection.

The paper was discussed by Dr. T. H. Manley.

This address will be found published in full in the New York *Medical Journal*, vol. L, page 281.

The business of the Branch was next in order.

There were no reports of delegates this year.

The annual report of the Executive Committee was then read, and, there being no objection, stood approved.

The Treasurer's annual report was then read, and, there being no objection, stood approved.

Under the head of reports of special committees, the Secretary announced that since the last meeting there had been three deaths among the Fellows of our district:

Dr. W. C. Pryer, of New Rochelle, a Founder.

Dr. J. S. Andrews, of Brooklyn, an Original Fellow.

Dr. I. H. Ashton, of Dobbs Ferry, who joined in 1885.

Some remarks on the life of Dr. W. C. Pryer are now in the hands of the Committee on Necrology.

The Secretary next proceeded to read sketches of Dr. J. S. Andrews, by R. M. Wyckoff, M. D., and of Dr. I. H. Ashton, by R. J. Southworth, M. D.

Under the head of unfinished business, the Secretary gave an outline of the Permanent Fund scheme from its beginning, and what had been done to further it under the direction of the Executive Committee, bringing into prominent notice the fact of its being purely *voluntary*—there being no attempt to disturb the ordinary course of assessments, as laid down in the by-laws, for those who preferred it. Finally the Execu-

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tive Committee had declared the fund established, and directed the Treasurer to proceed to collect the promised sums, there being sufficient promised to ensure a start being made on a substantial basis.

The Secretary stated that he had received a notice of the fifth annual meeting of the Fourth District Branch, to be held at Rochester, on May 14, 1889. The scientific papers being now in order, Dr. T. H. Manley read his paper on "The Genesis of Tumours."

Discussed by Dr. J. G. Truax.

This paper will be found published in full in the New York *Medical Journal*, vol. L, page 61.

Dr. F. E. Martindale then read his paper on "Calcification of the Cardiac Left Ventricular Wall, following Subacute Verrucose Endocarditis." The pathological specimen was shown in connection with the reading of this interesting case.

There was no discussion.

This paper will be found published in full in Gaillard's *Medical Journal*, vol. XLIX, page 11.

Dr. T. H. Allen's paper on "Traumatic Pelvic Cellulitis" was next read.

Discussed by Drs. Truax and Manley.

This paper will be found published in full in Gaillard's *Medical Journal*, vol. XLIX, page 226.

The choosing of a Nominating Committee, to elect an Executive Committee for the ensuing year, being then in order, the Secretary called off the counties of the district, and Fellows present from those counties appointed the following Nominating Committee:

Dutchess County,	Dr. Porteous.
Kings County,	Dr. Wyckoff.
New York County,	Dr. Manley.
Orange County,	None present.
Putnam County,	" "
Queens County,	" "
Richmond County,	Dr. Martindale.
Rockland County,	Dr. Govan.
Suffolk County,	Dr. Woodend.
Sullivan County,	None present.
Ulster County,	Dr. Van Hoevenberg.
Westchester County,	Dr. Southworth.

The Secretary then stated that this Nominating Committee were expected to meet during the intermission between the morning and afternoon sessions.

Adjourned at 2:30 o'clock P. M., to meet for the afternoon session at 3 o'clock P. M.

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AFTERNOON SESSION.

The afternoon session was called to order by the President, Dr. Lusk, at 3:30 o'clock P. M.

The scientific business was at once resumed by Dr. J. A. Wyeth being called upon to read his paper on "Some Recent Surgical Cases, with Comments and Deductions."

After the reading of the paper, the President asked Dr. C. S. Wood to take the chair for the remainder of the session, as he was obliged to leave.

Dr. Wyeth's paper was then discussed by Drs. Manley, Sullivan, and the Chair, and closed by the author.

It was moved and seconded that the thanks of the Branch be extended to Dr Wyeth for his thorough and interesting paper.

Carried unanimously.

This paper will be found published in full in the New York *Medical Record*, vol. XXXVI, page 169.

Dr. J. G. Truax next read his paper on "The Treatment of Pneumonia."

Discussed by Drs. Carroll, E. R. Squibb, S. J. Murray, Manley, the Chair, and the author.

This paper will be found published in full in the *Journal* of the American Medical Association, vol. XII, page 906.

The report of the Nominating Committee was then read as follows:

For members of the Executive Committee:

Dutchess County,	Dr. J. G. Porteous.
Kings County,	Dr. Wm. McCollom.
New York County,	Dr. T. H. Manley.
Orange County,	Dr. J. H. Hunt.
Putnam County,	Dr. Wm. Young.
Queens County,	Dr. Edwin Webb.
Richmond County,	Dr. F. U. Johnston.
Rockland County,	Dr. Wm. Govan.
Suffolk County,	Dr. W. D. Woodend.
Sullivan County,	Dr. T. W. Bennett.
Ulster County,	Dr. H. Van Hoevenberg.
Westchester County,	Dr. R. J. Southworth.

On motion, the report was accepted and approved, and the committee was discharged.

At the request of the permanent secretary of the American Medical Association, a printed notice was read of the approaching fortieth annual session of the National Association, to be held at Newport, R. I., on June 25, 26, 27, and 28, and an urgent request for all to be present.

The President received a pressing appeal from the chairman of the

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Rush Monument Committee, which the Secretary read, and requesting the Secretary "to transmit whatever sums may be contributed to the treasurer of the committee."

There was to be a call for a meeting of the newly elected Executive Committee, to be held immediately after adjournment, to elect a Secretary for the coming year, but, as a quorum was seen not to be present, the call was not made,—the present Secretary holding over until the next meeting of the committee.

Adjourned at 5:35 P. M.

The register showed forty-one Fellows and two visitors present.

W. T. LUSK, *President.*
E. H. SQUIBB, *Secretary.*

The seventh special meeting of the Fifth District Branch was held in the parlors of the Fowler House, Port Jervis, on Tuesday, August 27, 1889.

In the absence of the President, Dr. W. T. Lusk, the Secretary called the meeting to order at 2:15 P. M., and, upon motion of Dr. J. H. Hunt, Dr. W. B. Eager was chosen Chairman.

The meeting being called to order in open session, Dr. Eager's paper was the first order of business.

Upon motion, Dr. Hunt was asked to occupy the Chair while Dr. Eager read his paper on "Some Observations on the Use of Concentrated Lactic Acid."

Discussed by Drs. J. D. Sullivan, C. S. Wood, and the author.

This paper will be found published in full in Gaillard's *Medical Journal*, vol. XLIX, page 348.

Dr. J. H. Hunt next read his paper on "The Treatment of Typhoid Fever, with Special Reference to the Cold Water Method." The paper was accompanied by two long, carefully prepared, detailed charts of temperatures in the cases reported.

Discussed by Drs. North, Carroll, Risch, Sullivan, Steinke, C. S. Wood, Dr. Leroy J. Brooks, of Chenango County, Dr. R. A. Murray, of New-York city, and the author.

This paper will be found published in full in Gaillard's *Medical Journal*, vol. XLIX, page 353.

At this point Dr. A. L. Carroll was asked to exhibit a small, home-made apparatus he had devised for the ready estimation of CO_2 contained in the air, which was designed to obviate the necessity of purchasing the more expensive apparatus generally used.

Dr. H. B. Swartwout then read his notes, with the presentation of a case of empyema. The patient, a young man, was examined by Drs. C. S. Wood and Sullivan, and others.

The case was discussed in particular by Dr. Steinke, the Chair, Drs.

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W. W. Bidlack, of Milford, Penn., R. A. Murray, of New York, and the author.

This paper will be found published in full in the New York *Medical Journal*, Vol. L, page 459.

There were no presentations of specimens.

Under the head of voluntary communications, Dr. T. H. Manley offered a paper on "Injuries of the Skull, with Some Observations on One Hundred and Fourteen Cases." The paper was in the Secretary's hands, and, in the necessary absence of the author, it was his desire that either the Secretary should read it or it be read by title. It was read by title.

This paper will be found published in full in the Brooklyn *Medical Journal*, Vol. III, page 605.

Dr. H. F. Risch also had a subject which he desired to bring before the Branch for discussion, but, as the hour had arrived when the Committee of Arrangements had other business on hand, the executive part of the session was dispensed with, and the meeting adjourned at 4:45 o'clock P. M. to take part in an excursion to Milford, Penn.

The register showed eighteen Fellows, one Third District Branch Fellow, and eleven invited guests; and several more of the latter, who neglected to sign, were present.

W. T. LUSK, *President.*
E. H. SQUIBB, *Secretary.*

PROCEEDINGS OF THE EXECUTIVE COMMITTEE OF THE FIFTH DISTRICT BRANCH.

A meeting of the Executive Committee was held at 177 Montague street, Brooklyn, on Tuesday, May 28, 1889.

The President, Dr. W. T. Lusk, not being present, the Secretary called the meeting to order at 10:15 A. M., and, upon motion, Dr. J. G. Truax took the chair until Dr. Lusk's arrival.

Seven members present; seven absent. Present:

Dr. Wm. Govan.
Dr. F. U. Johnston.
Dr. J. G. Porteous.
Dr. J. G. Truax.
Dr. Van Hoevenberg.
Dr. W. D. Woodend.
Dr. E. H. Squibb.

The Secretary read the minutes of the last two meetings, which were approved.

The report of the Committee of Arrangements was then read and approved, and a vote of thanks was extended to them for their efforts in behalf of the Branch.

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REPORT OF THE COMMITTEE OF ARRANGEMENTS FOR THE ANNUAL MEETING, 1889.

The undersigned, as your Committee of Arrangements, respectfully submit the following report:

Being so well satisfied with the accommodations furnished last year, it was decided that the same rooms be retained for this meeting, and on the same terms. Accordingly the Magnolia lodge rooms were engaged, for the sum of ten dollars, with a fee of two dollars to the janitor.

As two sessions are required for the annual meeting, the hour of 11 o'clock A. M. was decided upon for opening the meeting, as heretofore.

Respectfully submitted,

(Signed) J. D. RUSHMORE, *Chairman.*
T. M. LLOYD.
J. C. BIERWORTH.
W. G. RUSSELL.
AVERY SEGUR.
W. T. LUSK, } *Ex officio.*
E. H. SQUIBB, }

The Chair then appointed Dr. Woodend to act with the Secretary as Registration Committee,—a second Fellow to be appointed later by the President from the general meeting.

The Treasurer next made his annual report as follows:

The Treasurer begs leave to report that there are now thirteen Fellows who have neglected, after several appeals, to pay their assessment of one dollar, made in December, 1886.

Receipts from January 16, 1885, to January 2, 1888, as per last statement,		$259.69	
Receipts from January 2, 1888, to May 28, 1889, as per cash-book,		11.38	
Total receipts from January 16, 1885, to May 28, 1889, as per cash-book,			$271.07
Expenses from January 16, 1885, to January 2, 1888, as per last statement,		$175.50	
Bills unpaid on May 28, 1888, as per last statement (now paid),	$17.75		
Bills paid from May 28, 1888, to December 31, 1888,	20.50		
Bills unpaid from December 31, 1888, to May 28, 1889,	24.25		
Total indebtedness for year ending May 28, 1889,		$62.50	
Total expenses from January 16, 1885, to May 28, 1889,			$238.00
Total amount in treasury on May 28, 1889,			$33.07

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Distribution of funds is as follows:

Deposited in Seamen's Bank for Savings, May 28, 1889,		$57.42
Bills unpaid, as stated above, May 28, 1889, ...	$24.25	
Due to Treasurer, May 28, 1889, ...	.10	
		$24.35
		$33.07

E. H. SQUIBB, *Treasurer.*

He presented his books and vouchers for examination, and the Chair appointed Dr. Govan to audit the accounts. Dr. Govan did not make any definite report, but handed the books and vouchers back to the Secretary during the general meeting, later in the day, without comment, which was understood to mean approval.

The subject of the time and place of the next meeting was then taken up. The President, Dr. Lusk, here took the Chair. After the Secretary had read the correspondence he had had with Dr. W. B. Eager, of Middletown, and Dr. J. H. Hunt, of Port Jervis, and after some little discussion by members of the committee, it was finally decided to hold a special meeting (the seventh) in Port Jervis, Orange County, on Tuesday, August 27, 1889.

Upon motion, the following were chosen as the Committee of Arrangements:

Dr. J. H. Hunt, Orange County, Chairman.
Dr. T. W. Bennett, Sullivan County.
Dr. W. C. Connor, Orange Connty.
Dr. W. H. DeKay, Sullivan County.
Dr. W. B. Eager, Orange County.
Dr. J. A. Munson, Sullivan County.

Upon motion, the Treasurer was next authorised to make an assessment of one dollar on all Fellows of the Branch, as provided by the by-laws.

Upon motion of the Secretary, the thirteen new Fellows recently elected were exempted from assessment this year.

Under the head of unfinished business, the subject of the permanent fund was brought up.

According to instructions from the Executive Committee, at its last meeting, the Secretary sent off, on November 2, 1888, the following additional and explanatory circular:

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FIFTH DISTRICT BRANCH

OF THE

NEW YORK STATE MEDICAL ASSOCIATION.

HEAD-QUARTERS, P. O. BOX 94, BROOKLYN.

With the idea of expanding the circular sent you some time since on the proposed Permanent Fund, in the way of still further explaining the full scope of the scheme, and in order to answer some of the questions asked by a few Fellows, the Executive Committee begs leave to state that the plan of asking a voluntary contribution is simply that of inviting the Fellows to anticipate their future assessments by an advanced payment. That is, instead of paying the $1.00 as provided for by the By-Laws whenever it becomes necessary, the Fellows, in this scheme, simply voluntarily pay in advance a certain sum according to their ability, which when put at interest pays their assessments forever afterward. Although not stated before, it has been, from the first, an essential part of the design of this scheme that all those who do not come into it, as well as all the new Fellows joining the Association hereafter, should, of course, be assessed regularly as before until they feel inclined to join in with the majority.

This Fund when established is designed to increase the usefulness of the Association by extending its scope, making the meetings inviting and more attractive, and thereby inducing others to join.

To take a case in point: From the present outlook of the Branch, it is proposed to make an assessment of $1.00 during the coming year on all the Fellows of the Branch for current expenses. Should this proposed Fund be established at that time, those who had joined in its benefits would not be called upon for this assessment, as the interest on the voluntary contributions they had already made would pay their share of the assessment without further appeal, and this same thing would happen for them each time an assessment was made.

It is now found that a subscription of $5.00 from each of the Fellows who have not already subscribed, with an increase to $10.00 from those who feel so inclined, will furnish the requisite amount to ensure the success of the Fund, provided a sufficient number of Fellows give the latter increased amount.

The reason why a stated proportionate sum is not asked from each Fellow of the Branch is, that all cannot afford it, especially the younger Fellows in the profession. Some apparently can better afford to pay the $1.00 periodically than a larger sum at any one time. Thus it is that the Fellows are asked to subscribe voluntarily in order that the excess over a proportionate sum from some may make up for the deficiency from others. It is only by so doing that it can be expected to raise the requisite amount to start the Fund.

This, then, is the whole matter as far as the Executive Committee is able to explain it; but, should any further questions suggest themselves, the undersigned will gladly attempt to answer them, as it is particularly desired that every Fellow should be heard from, one way or the other, and freely. Please make some reply.

By order of the Executive Committee,

E. H. SQUIBB, M. D., *Secretary.*

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Please return the following blank form, duly filled out, in the enclosed envelope, at your earliest convenience.

.....

Date.....1888.

I hereby agree to contribute the sum of..... dollars to the proposed Permanent Fund of the Fifth District Branch of the *N. Y. S. Medical Association*, with the understanding that this stipulated sum will not be called for unless the total amount necessary to put the Funds of the Branch on a permanent basis be guaranteed.

$.....

Signature.....

The Secretary stated that this brought out many favourable replies, which, from their import, showed that this scheme was not thoroughly understood before.

Not hearing from some whose reply he had expected, and it having been suggested to him that circulars, as a rule, were consigned to the waste-basket, the Secretary began, on February 28, 1889, to send out to all those Fellows of the Branch who had not replied up to that time, personal letters of appeal, urging a reply of some kind, that he might make some definite report at the next meeting of the Executive Committee.

This brought out some very gratifying replies, and now the Secretary reported that there were about $750 available, in these promises and in the treasury, for the use of the fund. From the nature of many of the written replies and personal conversations, many would promise no definite sum, but would do their share; and others, again, said they would give more if it was found necessary. With these explanations, the Secretary felt encouraged to state that he believed the requisite amount would be raised, if the Executive Committee would see fit at once to declare the fund to be established, in order to give definite evidence that a start had been made.

The Executive Committee then unanimously declared the fund should be established, and directed the Treasurer to have the following two forms printed and sent to the Fellows of the Branch,—the larger one to be sent to those who would subscribe to the fund, and the smaller one to accompany each assessment bill, in order to give the minority an opportunity to join in the benefits of the fund, each time an assessment is made:

NEW YORK STATE MEDICAL ASSOCIATION,

FIFTH DISTRICT BRANCH.

P. O. Box 94, Brooklyn.

May 28, 1889.

.....M. D.

Dear Doctor: The Executive Committee having received at this date a sufficient number of favourable responses to insure the success of the pro-

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posed Permanent Fund, thereby exempting all subscribers thereto from all future assessments, it now only remains to collect the stipulated sums promised in order to establish the Fund.

You are, then, hereby respectfully asked to enclose (in the accompanying envelope) your cheque for the sum of.....dollars, which you conditionally agreed to contribute in your favour of.....188..... Please draw your cheque to the order of E. H. Squibb, Treasurer, and return this notice therewith, to be receipted and sent to you for preservation.

W. T. LUSK, M. D. *President.*

$.....

Received Payment,.....1889.

.....*Treasurer.*

NEW YORK STATE MEDICAL ASSOCIATION,

FIFTH DISTRICT BRANCH.

A Voluntary Deposit with the Treasurer of $5.00 will entitle you to join in the benefits of the Branch Permanent Fund (now established), thereby exempting you from any future assessments,—the interest accruing from this deposit paying your share of the current expenses hereafter.

If any further particulars are desired, please communicate with the Treasurer.

By direction of the Executive Committee.

The Treasurer was also directed to make personal written appeals to all those who expressed their willingness to contribute an additional sum, and also to those who might be thought to be willing to do more if asked.

The next subject brought up was that of a journal to publish our Branch papers in.

The Secretary stated that he had received written appeals to publish our papers from the Brooklyn *Medical Journal*, Gaillard's *Medical Journal*, and the *Journal* of the American Medical Association. He read, in detail, the correspondence he had had with the assistant-editor of the latter journal, which was very satisfactory, but, owing to a change in the editorship at this time, the whole matter was now in abeyance.

After some little discussion, it was moved and carried that the matter of publication of papers be left in the Secretary's hands, and for the present the authors be allowed to select their own journal with the approval of the Executive Committee.

Upon special request of Dr. J. A. Wyeth, he was permitted to publish his paper, to be read at our present meeting, in the New York *Medical Record*, but entirely under his own supervision, and not to have it appear in any way as having been read before our Branch Association.

The Secretary reported the resignation of three fellows of the Branch since our last meeting:

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Dr. J. B. Lung, of Kings County, on August 1, 1888.

Dr. C. F. Keefe, of Ulster County, on March 23, 1889.

Dr. C. E. Lockwood, of New York, on March 26, 1889.

The correspondence of three more Fellows was read, stating that they thought they would have to resign on account of lack of time to attend, and removal from the state.

On August 14, 1888, the Secretary received some notes and clippings on the life of the late W. G. Stevenson, M. D., of Rockland County, from Mrs. W. G. Stevenson. From these notes a short sketch was written, and on September 26 it was forwarded to the Committee on Necrology.

On October 24, 1888, the Secretary also received a sketch of the late Dr. W. C. Pryer, of New Rochelle,—one of the Founders of our Association,—by W. L. Wells, M. D., of the same place. This sketch was at once forwarded to the Committee on Necrology, in order to be in time to appear in the transactions for the year.

The Secretary also announced the death of Dr. J. S. Andrews, of Brooklyn,—one of the Original Fellows,—which occurred on Thursday, January 3, 1889; and Dr. I. H. Ashton, of Dobbs Ferry, who joined the Association in 1885, and whose death occurred on Saturday, February 16, 1889..

The Secretary then read the annual report of this committee, to be read at the general meeting.

Adjourned at 11 : 20 o'clock A. M.

E. H. SQUIBB, *Secretary.*

A meeting of the Executive Committee was to have been held in the Fowler House, Port Jervis, on Tuesday, August 27, at 1 : 15 o'clock P. M. but as Dr. J. H. Hunt and the Secretary were the only two members of the committee present, the meeting could not be held. The Secretary merely made the statement, for the minutes, that he had received notices of the meetings of the Second District Branch and the First District Branch, to be held on June 18 and July 2, respectively.

E. H. SQUIBB, *Secretary.*

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NEW YORK COUNTY MEDICAL ASSOCIATION.

ANNUAL REPORT.

In conformity with the constitution and by-laws, as well as the established practice, the undersigned herewith respectfully report an abstract of the proceedings of the Association for the year commencing October, 1888. The nine stated meetings have been held, at each of which (with the exception of the annual meeting for the election of officers) one or more papers have been read, with full and free discussion of the same. The papers have been of more than ordinary merit, as evinced by their wide publication in the journals, and the favourable editorial comments made on them, as well as the extracts taken from them by foreign journals.

The discussions (although eliciting strong personal opinions) have been characterised by urbanity and kindly feeling toward those who might differ in opinion. In short, scientific research has been the aim and object of each and every one of the members.

The usual collation has been served at the close of each meeting, not only to the members, but to the invited guests and the stranger within our gates. At these meetings the members became better acquainted with each other, the new members being introduced and at once made to feel at home, so different from most of our large societies, where one may attend for years, hear papers read and discussed, and yet personally be acquainted with but very few of his associates. The initiation of these collations, and the happy results arising therefrom, must be ascribed to the active and energetic efforts of the man who has done more than any other one in the organisation and perfecting of our Association. The man will be recognised without speaking the name of J. W. S. Gouley. Our meetings have not only been well attended, but a spirit of interest has been manifested much greater than is usually observed in our older, and perhaps larger, societies, a seeking after truth for truth's sake, an effort both to give and to receive instruction, not only for their own satisfaction, but for the welfare and happiness of their patients.

Not only is there increased interest in our meetings, but the number of our members has also increased in like proportion (now numbering 337), while the finances are in a sound and healthy condition, the dues (which are small) being, as a rule, promptly paid.

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Since January, 1889, our meetings have been held in a more central location, to the satisfaction of most of the Fellows, and with a largely increased attendance.

STATED MEETING, OCTOBER 15, 1888.

Dr. J. ADLER read a paper entitled "Some Remarks on Akromeglia." He said that in 1886 Marie first described a new affection, to which he gave the name of akromeglia. This designation, which simply meant enlarged extremities, was not very satisfactory, but it had now been generally accepted; and in our present total lack of knowledge regarding the pathology of the disease, it would perhaps answer as well as any other. Since Marie's paper had appeared, several cases had been reported in Europe, but the patient presented this evening was the first that had ever been known in this country.

She was a native of Germany, thirty-four years of age, married, and first came under observation in February last, at the German Hospital. Her mother had died from the effects of a fall, but her father was still living. She also had three brothers living, all in the enjoyment of robust health. She was strong and healthy, she stated, up to the age of eighteen or twenty, the time of the onset of her present trouble not being clearly remembered. She began to menstruate in her fifteenth year, but the periods were always irregular, and at the end of three years disappeared altogether. She thought she was about twenty when she first noticed that her feet would swell from time to time, although a bandage or a tight-fitting shoe, she said, would always readily reduce the swelling. About this time she also noticed some enlargement of the submaxillary and other glands.

The patient was unable to give any exact account of the present abnormal growth. She was married in her twentieth year, and when she was twenty-three her wedding ring became so deeply imbedded in the tissues of her finger that it had to be removed with a saw. She suffered principally from pain in the back, and weakness, and was also subject to frequent attacks of migraine. The pain in the back she attributed to a long ride, from the effects of which she never recuperated. She was unable to walk, and spent the most of her time in a semi-recumbent position.

On looking at the woman, one was at once struck with the immense size of the head and the marked projection of the lower jaw. At the first glance, it looked like a case of myxoedema, or one in which there had been complete extirpation of the thyroid gland. The entire cranium was greatly enlarged, and the protuberance of the occiput was especially marked. The lower jaw was immense, and the tongue was greatly hypertrophied and flabby. There was no alteration in the teeth, except

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that those in the lower jaw were separated to some extent from each other. The hair was abundant. All the lymphatics of the neck were greatly enlarged. On a superficial inspection, there was an apparent lack of the thyroid gland; but a more careful examination, especially during the act of deglutition, showed that the left lobe and the isthmus could be distinctly felt, although the right lobe seemed to be wanting. No trace of the thymus gland could be detected. The clavicles were markedly enlarged, especially at their sternal extremities. The ribs were also greatly enlarged, and beginning kyphosis and a peculiar bulging shape of the chest, due to their hyperplasia, could be observed. There was comparatively little adipose tissue at any point. The bones of the arm and forearm all showed enlargement of the extremities, and there was reason to believe that slight lengthening of the shafts had also taken place. The hands were immensely enlarged, although there was no deformity of the nails, as has been noted in some of the other cases of akromeglia. The muscles everywhere were flabby and atrophied. The skin was markedly hypertrophied, but remained for the most part soft and pliant.

The same general condition of affairs was found in the pelvis and lower extremities. The feet were enlarged even more than the hands, being simply colossal in size, and there was also enormous hyperplasia of the epiphysial region and the patellae in the legs. It was noticed that there was marked hyperaesthesia in all the hypertrophied parts, even slight pressure causing the patient to wince. As regards the internal organs, a careful examination of the eyes with the ophthalmoscope revealed no organic disease. Repeated chemical and microscopical examinations of the urine showed no evidence of any kidney trouble, and the red and white corpuscles of the blood were both found to be normal in number and appearance, although to the eye the patient seemed anaemic. The heart and lungs and all the other organs, as far as could be ascertained, were entirely normal. The appetite was fairly good, but the bowels showed a tendency to obstinate constipation.

The electrical examination showed some departures from the normal. The resistance of the skin to the faradic current was enormous. Otherwise the cutaneous sensibility was not diminished. As regards the galvanic current, there was considerable diminution of the electrical excitability, which was most marked in the peronei of both lower extremities. Still, there was no evidence of any degeneration going on in the nerves, and the want of electric excitability could well be explained on other grounds. There was evidence of well marked psychic degeneration in the patient. She was described as having been a bright and lively girl, but she was now very dull and apathetic.

Dr. Adler then went on to make some general remarks on akromeglia, founded on the observations of European authorities. In most partic-

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ulars, he said, this case corresponded very closely with those met with abroad; but there was one feature which was peculiar to it (being noted in none of the others), viz., the widespread hyperplasia of the lymphatics. As regards the *post-mortem* appearances in this affection, Klebs was the only author who had made anything like a satisfactory report. He had found a general hyperplasia of the connective tissue, and marked proliferation of the blood-vessels. There was also enlargement of the various nerves, especially the ganglia of the sympathetic. In the brain he found well marked hyperplasia of the hypophysis cerebri; and the question naturally arose whether there was any connection between the enlarged hypophysis and the enlargement of the nerves. Klebs was inclined to attribute the disease to the proliferation of blood-vessels; but this was purely fanciful and speculative, and at present the true pathology of akromeglia remains shrouded in profound mystery. As regards the matter of prognosis, this was not particularly bad so far as life was concerned. In Europe two of the cases which had been first observed as long ago as 1867 were still alive. In some of the cases there were abnormal conditions of the heart. In most of them the thyroid gland was diminished in size, or apparently altogether lacking; but in two it was markedly hypertrophied, and was no doubt diseased. Amenorrhoea was a constant characteristic of the disease.

Dr. W. R. BIRDSALL expressed the great pleasure it afforded him to see this case, the first of its kind ever reported in America. He did not think that he could throw any light on the pathology, though there seemed to him to be some mysterious connection between akromeglia, myxoedema, and extirpation of the thyroid. He said that he had at present under observation a young girl suffering from amenorrhoea, who had developed some enlargement of the extremities of the phalanges of the hands, and, to a less extent, of those in the feet. It might, possibly, be an incipient case of akromeglia, but it was yet too early to form a definite opinion in regard to it. As regards the electrical reactions in Dr. Adler's case, he thought we ought to be very guarded in drawing conclusions.

Dr. ADLER said that it seemed to him that the hyperplasia in and about the nerves might of itself offer a sufficient explanation of the diminished electric excitability.

Dr. A. L. CARROLL said that profound gratitude was due to Dr. Adler for the most admirable clinical demonstration which he had given of his unique case. Ever since he had first read an account of this new disease in the journals, he had been waiting in the hope that some one would find a specimen of it in this country, and it now afforded him extreme pleasure to have the opportunity of seeing the first one reported.

The question of treatment having been suggested, Dr. Adler stated that, in the total absence of knowledge of the cause of the disease, all

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treatment, as far as interfering with its progress was concerned, was without avail. The patient was simply kept in bed, and her functions regulated as well as possible. The attacks of migraine, to which he had referred, could always be efficiently combated with antipyrin.

Dr. J. LEWIS SMITH presented a case of athetosis. As this was a comparatively rare affection, he thought this case ought to go on record. The patient was a girl of eighteen in his service at Charity Hospital. Both her parents had died of consumption. She stated that she was well up to the age of seven years, when she had an attack of scarlatina, complicated with diphtheria. This was followed by general dropsy, and she said that it was at this time that she first noticed the paralysis of the left side of the body, from which she still suffers. One year later the arm began to be drawn backward behind the body, and it could now be seen in that position, like a rudder, with tonic contraction of the extensor muscles, and the fingers thrown far back. Soon after the appearance of the paralysis, the patient began to suffer from epilepsy. The attacks were for a time of the nature of *petit mal*, but had gradually grown more severe, and now constituted *grand mal*.

Dr. M. ALLEN STARR, at the request of Dr. Smith, had prepared a communication concerning the case, which Dr. Smith then read, in which he gave a *résumé* of some of the latest researches in regard to the condition here met with. In it he stated that he found that all recent writers mention athetosis as a frequent complication of spastic infantile hemiplegias connected with epilepsy. In this condition club-foot was apt to be present, as here, and the patient walked on the toes. Such cases presented undoubted evidence of an irritation carried down to the spinal cord from the cortex; and as there was irreparable injury in the cerebral centres, nothing could be expected from treatment.

Dr. W. R. BIRDSALL, on the invitation of Dr. Smith, made a demonstration of the case. He first called attention to the fact that the face and the left side were involved slightly in the contracture. Sometimes, when she brought the affected arm forward with the other arm—an action which required considerable exertion—the foot, which was habitually inverted, would become inverted. At night, as was usually the case in such patients, during sleep, he had no doubt that the arm became relaxed. These cases are mostly instances of infantile hemiplegia, and all that he had observed had begun before the age of ten years. There could be no doubt that Dr. Starr's explanation of the pathological condition is the correct one. There is a destruction of tissue in the cortical areas, by reason of which the impulses from the brain are transmitted irregularly, and not in a coördinate manner. The condition varies from the ordinary contractures met with in hemiplegias in there being more mobility; and it also differs from ordinary athetosis, in which there are more movements with but little contracture. It was, therefore, a mixed

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case. Athetosis, as is now well known, is a symptom of hemiplegia, and particularly infantile hemiplegia. In infants an athetoid condition of the fingers is normal, these members being constantly in motion; and the earlier the paralysis occurs, the more marked will be the athetosis. This case was almost the exact counterpart of one that he had seen in a boy who also was in one of the city institutions on the island.

Dr. DANIEL BROWN read a paper on "The Arrest of Secretions in the Eruptive Fevers." He took scarlatina as the type, and said that it was not so much the drain itself that proves fatal as the accidents and sequelae liable to attend it. There is a marked determination to the skin, and the mucous and lining membranes, and unless the secretions can be kept in efficient operation, serious inflammations are likely to result from the congestion incident to the irritation produced by the poison in the system. He is in the habit of commencing his treatment with small doses of bromide of potassium or sodium and tincture of aconite root, the object of the bromide being to allay nervous irritability, and of the aconite to diminish the frequency of the pulse. In a short time he commences the administration of carbonate of ammonium, which for the last twelve years he said he had regarded as his sheet-anchor in the treatment, on account of its stimulating effect on the secretions. The dose is very small, only one half or three quarters of a grain, and it is usually repeated every hour or so, in a solution containing elixir of cinchona. The skin is kept anointed with vaseline, and at night he often gives small doses of jalap and calomel, as advocated by Prof. William H. Thompson. Under this plan of treatment he found that the eyes or ears are seldom affected, and kidney trouble seldom ensues as a sequela. The treatment, of course, varies according to circumstances in different cases; but the chief point that he always has in view is the maintenance of the secretions.

Dr. CHARLES A. LEALE said that while he regarded scarlatina as an acute, self-limited, infectious disease, there is always a certain amount of deleterious matter in the system to be gotten rid of; and it is of great importance to pay attention to all the glands and secretions so that the poison may be eliminated. He would certainly be much delighted if he could find a remedy which would act as a preventive of complications and sequelae, but he did not know of one at present. The carbonate of ammonium, so lauded by Dr. Brown, he should think would only add another foreign element to the blood, and he believed that pure water would be much more serviceable in keeping the secretory organs free.

Dr. S. B. W. MCLEOD said that he believed that, as a general rule, the less medicine is given the better, though after the acute stage the tincture of chloride of iron is usually of service in shortening convalescence.

Dr. C. S. WOOD said that it was to be borne in mind that the fatality

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of diseases like scarlatina varied very greatly in different epidemics. At present the scarlet-fever met with in New York is of a comparatively mild type, and the percentage of deaths from it is very small, except in the cases accompanied with diphtheria, which seemed to be now the complication most to be dreaded. The views advocated in the paper he believed were correct, and he had always found that aconite in small doses had a good effect on the function of the skin. In all the zymotic diseases he had been in the habit for the past thirty years of employing hyposulphite of sodium after the first day or two, and he was convinced that the sulphurous acid which was set free from this compound had a most beneficial effect in counteracting the poison in the system, whatever it might be. In many cases of scarlet-fever it seemed to him that this remedy had not only the effect of modifying the severity of the disease, but also of actually cutting short the attack to some extent.

Dr. FARRIES thought that in scarlatina nothing fulfilled the indications better than aconite in small doses to lower the pulse, and a mild diuretic and sudorific containing buchu or uva ursi with a little sweet spirits of nitre. In addition, the surface of the body might be sponged every two or three hours with lukewarm water containing a little carbonate of sodium, for the purpose of reducing the temperature.

Dr. LEALE said that in 1865, when he was in the army in Washington, where infectious diseases, particularly pyaemia and typhoid fever, were very prevalent, a thorough trial was given the hyposulphite of sodium in this class of affections, and the conclusion was reached by the surgeons who experimented with it that it had no appreciable affect upon them. In acute febrile diseases the two great objects are to eliminate and to maintain.

THE PRESIDENT said that there were a certain number of cases of scarlet-fever in which death resulted, not from any accident or sequela, but from the direct violence of the attack, the poison introduced into the system being so malignant as promptly to overwhelm the nervous centres and the powers of life like an avalanche. As regards the glandular system, there is always danger of trouble. For instance, in the kidneys, as the result of over-stimulation and over-action in eliminating a poison to which the organs are not accustomed, the epithelium of the glomeruli is apt to be thrown off, and, in consequence of this, tubular nephritis results. In the zymotic diseases in general, he thought other methods of treatment besides those aiming at securing elimination are often called for; and it is highly desirable that we should have at our command remedies which may act directly on the poison and have the effect of preventing fermentation. In conclusion, he said that in his experience he had found that, as a rule, any looseness of the bowels, whether occurring spontaneously or resulting from the use of cathartics, had an unfavourable effect.

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Dr. BROWN, in reply to the President, said that he did not by any means claim to cure all his cases. He quite agreed that the malignant cases referred to did sometimes occur; but in these he believed that if only a few doses of such remedies as the bromides could be given to allay the nervous irritability produced by the poison, there would result a certain amount of improvement, even if the effect was not sufficient to prevent a fatal termination; while in others, which would unquestionably prove fatal if left to themselves, death might be averted by the prompt measures adopted.

At the November meeting a paper was read by Dr. J. G. TRUAX on Pelvic Abscess, with sinuses as a result of a laceration of the cervix uteri, giving a graphic picture of the serious results which often follow this usually harmless injury following parturition. It was discussed by Drs. Leale and Carroll.

A second paper was read by Dr. H. S. Oppenheimer entitled "Headaches and other Nervous Symptoms caused by Functional Anomalies of the Eye," which was listened to with great interest, and discussed by Dr. A. L. Carroll. Dr. J. W. S. Gouley presented several interesting pathological specimens. Specimens were also presented by Dr. Biggs, and discussed by Drs. Carroll and Gouley. The report of the Recording Secretary was then read and approved.

At the December meeting a paper was read by Dr. J. W. Heitzman on "Hyperplasia of the Pharynx and Naso-pharynx," of a very able and instructive character, which was discussed by Drs. B. W. McLeod, C. S. Wood, and J. G. TRUAX.

Also a paper by the president, Dr. J. R. McGregor, on Oxalmia, which was characterised by the usual erudition and profundity of thought of its author. Discussed by Drs. J. W. S. Gouley and TRUAX.

Dr. A. L. Carroll presented interesting pathological specimens.

Nominations of officers then took place for the forthcoming year.

At the annual meeting in January, 1889, no formal papers were read, the session being occupied by the reports of the Executive Committee, Corresponding Secretary, Treasurer, and in the election of officers.

The election resulted as follows:

President—C. S. WOOD.
Vice-President—G. T. HARRISON.
Recording Secretary—P. B. PORTER.
Corresponding Secretary—A. D. RUGGLES.
Treasurer—J. H. HINTON.
Member of the Executive Committee—S. B. W. MCLEOD.

At the February meeting formal addresses were delivered by the retiring president, Dr. J. R. McGregor, and the president-elect, Dr. C. S. Wood. The former was mainly devoted to the consideration of the

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relations of medical science to the various interests of the community, the advancement of the standard of medical education, and the advantages to be derived from active work in medical societies.

The theme of the latter was "*Vis Medicatrix Naturae.*" This Dr. Wood believed to be for the most part a delusion and a snare, and denounced the so called expectant treatment of disease. He stated that his faith in drugs had only increased with his nearly forty years of experience in practice. A portion of the address was taken up with suggestions for increasing the efficiency and scientific work of the Association, especially in appointing a greater number of Fellows on committees, that more work might be done, and more men enlisted in the furtherance of the mutual good.

The March meeting was well attended, and much interest manifested in a paper by Dr. J. LEWIS SMITH on "The Cause, Mode of Propagation, and Prevention of Diphtheria." Stating that, although the belief that this disease is of microbic origin is constantly being strengthened by the investigations made in regard to it, it is still a matter of doubt what microbe (or possibly microbes) is the causal agent, he first gave an admirable *résumé* of the bacteriology of the subject as developed by various observers during the last twenty years. It was, he said, the conclusions of Drs. Curtis and Satterthwaite, based on their investigations made in 1877 under the auspices of the New York Board of Health, on the etiology and pathology of diphtheria, that evidently prepared the way for the theory that the bacteria themselves are not the direct cause of the disease, but that ptomaines produced by their agency may be. In his most recent utterances Oertel expressed the opinion that, while bacterial organisms gave rise to diphtheria, they did so not by their direct action, but by producing a ptomaine which infects the system and causes the disease to become constitutional. The microbe itself was mostly confined to the surface, while the action of the virus is widespread and deep. The most eminent pathologists of the present time, said Dr. Smith, do not express any more positive opinions in reference to the action of the specific principle or germ of diphtheria. In the earliest formed membranes Oertel found that many kinds of microbes could be isolated; but practically there are two chief kinds,—chain-forming cocci (the streptococcus), and rod-shaped bacteria with rounded extremities (bacilli). In a pseudo-membrane of twelve hours' continuance micrococci abounded mostly on the surface, but in the fibrinous net-work the bacilli, often in colonies, preponderated. In a specimen of twenty-four hours' duration the upper surface was full of cocci, and below them were bacilli. In concluding this portion of the subject Dr. Smith stated that during the past year Dr. T. Mitchell Prudden, one of the most skilled and trustworthy of our pathologists, has been making a series of careful investigations, the results of which will shortly be published in the

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American Journal of the Medical Sciences, which seem to indicate the strong probability that the specific microbe of diphtheria is a streptococcus.

In treating of its mode of propagation, he said that no fact was better established than that diphtheria does not arise *de novo*. Like eruptive fevers, it is produced by the reception in or upon some part of the system of the preëxisting specific poison. The extreme contagiousness of diphtheria from person to person is well known, and the virus adheres tenaciously to objects on which it happens to alight. The clothing of a patient, even when the disease is of the mildest form, his bedding, the furniture of his room, and the objects which he handles, may for weeks afterward communicate the disease. Dr. Sternberg, in his recent Lomb Prize Essay, also mentions the fact that all damp, foul places, such as sewers, cellars and ill-ventilated spaces under floors, afford conditions favourable for the development and propagation of the diphtheritic virus. The virus, once received, may be propagated in such a place for an indefinite time, and, ascending in the vapours which arise from this culture-bed, it is liable to communicate the disease to any one who inhales it. Thus, in New York city, prior to 1850, although foul sewers and unsanitary conditions existed, there was no diphtheria; but in the decade following 1850 this disease was introduced. The germ made its way into the sewers under ground, and now wherever sewer-gas escapes into the domiciles of the city it carries with it the diphtheritic poison. The amazing vitality and power of propagation of this virus are apparent when we reflect that it has permanently infected the New York sewers, so that children in all parts of the city are constantly falling ill with the disease. It is chiefly by exposure to the emanations from this widely extending culture-bed and to walking cases, often so mild that there is little or no complaint of the throat or impairment of the general health, that diphtheria is so prevalent here. The diphtheritic virus is so subtile, and its vitality and power of propagation are so great, that when it is once established in a sewered city the disease can probably never be stamped out, as cholera and yellow-fever can.

Diphtheria is commonly communicated by the inhalation of air containing its specific principle, from whatever source the latter may be derived. More rarely the contagion is contracted by means of direct contact with some infected substance, such as a particle of the diphtheritic exudate, muco-purulent secretion from an infected surface, or the blood of a patient. Observations are also accumulating which show that diphtheria, or a disease closely resembling it, occurs among animals, and is sometimes communicated from them to man. Having mentioned several recorded instances of this, he spoke of experiments by different observers which would seem to show that diphtheria can be transmitted from man to animals, and stated that if this were true, it might be

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inferred that it could likewise be transmitted from animals to man. Such observations and experiments, he went on to say, render it probable that genuine diphtheria, equally fatal, and attended by the same symptoms and anatomical characters as in man, does occur in birds, whether wild or domesticated, and in certain quadrupeds, as the rabbit. Nevertheless, it should be added that certain eminent pathologists, among them Virchow, have doubted the identity of animal and human diphtheria. With our present light upon the subject, he thought that it was evident that, since our relations to domestic animals are so close, if they are sick with any disease resembling diphtheria the same precautionary measures should be taken to prevent infection of the family as in human diphtheria. Having stated that milk was a culture medium of various microbes, and that it was probable that it may be the medium of communication of diphtheria as well as of scarlet-fever, Dr. Smith referred to several instances of such apparent communication observed by different writers.

In concluding this portion of the subject he said that the fact that diphtheritic virus may be conveyed long distances without losing its power is now admitted from the many observations that have been made, and the statistics given by Prof. C. W. Earle, of Chicago, in his paper on this subject before the Ninth International Medical Congress, render it probable that the infection is not infrequently transmitted over long distances to salubrious rural localities by means of articles of clothing and merchandise.

In speaking of the prevention of diphtheria he said that, as regards the small extent of the area of its contagiousness and the persistence and highly infective character of its virus within that area, this disease resembles scarlet-fever, and is unlike measles and pertussis, the specific principles of which, although they have a wider contagious area, are more volatile and more quickly dissipated. The most efficient method of preventing the propagation of diphtheria, he went on to say, is the isolation and disinfection of patients, the prompt and thorough disinfection of the apartments occupied by them, with their furniture and bedding, and the exclusion or prevention of all noxious germs. He thought there was reason to believe that disinfection, as commonly practised, is inadequate; and in this connection he referred to the outbreak of diphtheria in the spring of 1888, which he described in full in the paper on "Diphtheria of the New-Born," which he read in May last before the Fifth District Branch of the New York State Medical Association. Here, it will be remembered, the ward was carefully fumigated with the dry vapour of burning sulphur, and after the fumigations there were found in the apartment quantities of living bacteria which were identical with those found in connection with diphtheritic cases previously treated there.

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As bearing on this result he read an interesting communication from Dr. E. R. Squibb, the eminent chemist, of Brooklyn, sent in compliance with a request for his opinion, in which the latter stated that in our present state of knowledge all that could be said in regard to sulphur fumigation against infectious material was, that it is of doubtful efficacy, with the weight of the highest authorities in bacteriology against it. But to this it must be added that it is still largely used by very intelligent bodies in large institutions, health boards, etc., where it would not be likely to long maintain an unearned confidence. Dr. Squibb believed that many of the recent failures with sulphur fumigation might, perhaps, be due to the fact that the fumes were applied dry, while formerly the surfaces of the apartment to be disinfected were all wetted, and the pot of burning sulphur was set in water or wet sand in order that the heat might evaporate off a constant supply of watery vapour. Most, if not all, chemical disinfectants were in a state of tension, ready to change on coming in contact with the matter to which they were applied, and these changes were either by oxidation or de-oxidation, while the moment of greatest power or activity was the moment of change, when, by reacting on infectious matter they passed from a state of tension to a state of rest under new relations. The agency through which these changes almost invariably became operative was the vapour of water. Having explained the chemical reactions which took place when sulphur was burned in a moist atmosphere, he said that if no moisture were supplied, that present in the air and on the surfaces of the chamber would soon be used up, and the dry gas remain in a comparatively inactive, inefficient condition. The anhydride would necessarily destroy all organisms which breathed in any degree, because breathing surfaces were moist. But in embryonic life protected by shell, if the shell were dry the gas would be impotent. Many bacteriologists had admitted that burning sulphur would kill bacteria, but not germs.

Having mentioned that Dr. Llewellen Eliot had recommended during the continuance of a case of diphtheria the constant evaporation of turpentine over a water bath for the purpose of destroying the virus of the disease, Dr. Smith said that he had himself employed the following prescription for disinfection during his attendance on cases, with apparently such good results that he felt encouraged to continue its use:

℞

Acid. carbolici	
Ol. eucalypti ää	f℥j
Spts. terebinth.	f℥vj

Of this, two table-spoonfuls are added to one quart of water, and the mixture placed in a shallow pan. It is to be maintained in a constant state of simmering in the room occupied by the patient.

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He next prescribed the disinfection carried out some years ago by Prof. Ogden Doremus in the wards of Bellevue Hospital, where pyaemia had been prevalent, by means of chlorine gas freshly set free, and then went on to say that diphtheria would continue to spread, and largely increase the aggregate of deaths, unless stringent measures were employed to prevent its propagation by mild walking cases. He saw no way of doing this except by enforced inspection and surveillance of children by parents, nurses, and teachers; and he thought that wherever diphtheria was at all prevalent children who had the least sore throat should be excluded from the schools and compelled to remain at home.

In order to adopt adequate preventive measures, the fact should also be recognised that third persons who have had no diphtheritic symptoms themselves, and infected apparel or furniture may be the medium of communication. After recurring to several recorded instances of this kind, he said that nurses and physicians attending diphtheritic patients should avoid as far as possible the infection of their persons and clothing. Physicians in examining the fauces of children with diphtheria were very liable to receive upon their faces or clothes particles of the pseudo-membrane or infected muco-pus ejected by the violent cough excited by the examination. This might to a considerable extent be avoided by standing on one side during the examination; but he himself constantly carried corrosive sublimate with him, washing his face and hair with a solution of it before leaving the apartment, if he suspected that he had received any particle of the infectious material upon his person. Physicians thus exposed should also make use of precautionary measures before going to visit other children.

In conclusion, he referred to the paper read by Dr. H. Caillé, before the New York Academy of Medicine, in January, 1888, on the prevention of diphtheria, in which he stated that occasionally children had a recurrence of diphtheria each spring or autumn. Thinking that such children might perhaps harbour or carry with them the germ of the disease, he selected eight children having a permanent residence who had had repeated attacks of diphtheria, and subjected them to prophylactic treatment. All carious teeth were extracted or filled, and the mouth was rinsed after each meal with a solution of potassium chlorate, sodium chlorate, or sodium borate. The solution was also gargled or drawn through the nostrils. With this treatment the children had escaped the customary diphtheritic attacks during the two years that had elapsed since it was undertaken.

Dr. J. H. Hinton, the Treasurer, reported a balance on hand of $509.

Dr. J. G. Truax, of the committee appointed to consider the advisability of selecting a more central location for the meetings of the Association, reported that it had held several meetings, and, with the Executive Committee, had decided to send out cards to every member, in order

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to obtain the sense of the members; and as a result it was decided that for the present the meetings should be held at the hall of the Academy of Medicine, 12 W. 31st St.

At the April session Dr. T. H. MANLEY presented, by invitation of the chair, three cases of injuries, as follows:

First, a boy who had received a compound fracture of the leg, being three years of age, by a railway accident. Amputation was at first considered imperative; but on account of objections on the part of the mother the operation was not performed, and the limb was saved. Almost the entire shaft of the tibia became necrosed, and was removed, care being taken to preserve the periostium, with complete recovery. The fibula was fractured in two places, but was entirely preserved.

The second case was a boy with fracture of the leg, and, like the first, illustrated the advantages of conservative surgery. In this case the fragments of the bone were wired together, with a complete and perfect recovery.

The third case was one of *osteo-malacia* in a woman, and resection of the knee-joint cap, to be followed by amputation above the lower third of the femur.

Dr. JOHN SHRADY read a very able paper on the signs of the moribund condition.

Dr. N. J. HEPBURN read a paper on "Binocular *vs.* Monocular Vision."

Dr. ALFRED CARROLL exhibited a modification of Common's stethoscope devised by himself.

The May meeting was well attended, and much interest was manifested in a paper read by Dr. T. H. MANLEY, entitled "The Operation for Strangulated Hernia by the McBurney Method, with Report of Three Cases." He gave a description of the operation of McBurney, and its advantages. As far as he could learn he was the first to report any cases of strangulated hernia which had been dealt with by this method, and claimed that for this class of cases it seemed the ideal operation, the operative procedure consisting of a few simple principles, which, if correctly understood and intelligently applied, must generally lead to successful results.

Briefly stated, they were the ligating of the sac and the sewing down of the cutaneous margin of the incision to the conjoined tendon and the aponeurotic structures, in the inguinal variety of rupture, and the securing of a dense cicatrix over the internal ring, the canal having been previously opened to this point.

CASE I was a man, aet. forty-five, who had had a hernia on his left side as long as he could remember, requiring him constantly to wear a truss. At times, when his bowels were constipated and he strained more than usual at stool, the protrusion would come down under the bulb of the truss. Sometimes he would have to lie quiet a few hours before he

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could readily return it. On the morning before he entered Harlem Hospital, however, it came down in greater volume than ever before, and he could not return it. He came into the hospital in the evening, and an immediate operation was advised; but he would not consent, thinking that he might reduce it himself later. On the morning of the third day vomiting commenced, and he was very much reduced in strength when he asked to have an operation done.

In the afternoon he was put under ether, an incision was made from a point about the middle of that line, bounded above by the anterior-superior iliac spine and the pubic symphysis, just over the internal ring; the incision was carried downward over the inguinal canal, over the protrusion, to nearly the base of the scrotum. By dissecting from above at the outset, as recommended by McBurney, the neck of the sac was first sought, and the opening continued downward till the serous covering was reached and divided. The hernia was found to consist mostly of intestine; its coat was of a dark, rather ashen, hue, and was constricted at the external ring. Dr. McBurney advises that the testis and spermatic cord be left undisturbed; but in this case there was no true sac,—neither was the cord or testis visible. In opening up the canal, the small, atrophied, undeveloped, generative organ was found and removed. The bowel was now returned, the sac carefully dissected away from adhesions, drawn down, ligated, and cut off high up, silk ligatures being employed. The borders of the incision were sewed down, on the one side to the conjoined tendon, and on the other to the *fascia transversalis* and the margin of the divided canal—six sutures were employed on each side; then both edges of the wound approximated by the retentive or tension sutures, the whole line of incision dusted with iodoform and carefully packed with iodoform gauze. Over this the usual dressings were applied.

The patient survived the operation but three hours. In this case it was claimed that, in delaying the operation until there was profound exhaustion, and septic infection had full play, the effort to relieve him was made only as a forlorn hope, and that, had an operation been done earlier, he would undoubtedly have recovered.

Case II was in a man of twenty-five, with a history similar to the preceding as regards duration. He had had a hernia from boyhood, and on the day of entrance to the hospital the rupture came down, after he had made a heavy lift; and, as is usual in those cases, he came for relief to the hospital only after his family physician had failed to relieve him. His hernia was on the left side, very small, and not tender, or very sensitive on manipulation. He suffered no pain whatever; and, though an operation was advised before constitutional symptoms might arise, he declined it. The following day signs of strangulation were present, and septic infection was undoubtedly at work.

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The small protrusion of the previous day had greatly enlarged. He had incessant vomiting, a very weak pulse, and was greatly prostrated. It was feared, under the circumstances, that he would probably meet the same fate as the first.

His case was dealt with as was that of the man who succumbed, though, owing to some difference in the anatomical arrangements of the tissues, a slight modification was made. Here the hernia was found to be congenital, the sac containing, along with the testis, a large mass of omentum, and a small knuckle of intestine. As the testis was much smaller than its fellow, and probably functionally useless, it was enucleated. In this instance a speedy recovery followed the operation, and he left the hospital cured on the twenty-ninth day.

CASE III was a female, aged fifty-four, with a history of having worn a truss more than fifteen years. Her hernia had been down ten days when she was brought to the hospital. She was greatly collapsed, with cold extremities and persistent vomiting. It was a question as to whether she could endure an operation. In this, as in the others, the same method of operation was undertaken. Her hernia was of the indirect, inguinal variety, following along the round ligament to the labium majus. She had a thick, fat, pendulous abdomen, requiring a very deep incision to expose the constriction, which was found just inside the ring. There seemed to be no canal of any length. The sac, which was as thin as gauze, was adherent to everything—on the outside to the connective tissue, and on the inside below to the omentum, which partly filled it. A very small portion of intestine was found tightly nipped at the point of strangulation. This woman made a good recovery, though, owing to the great depth of fat in the region of incision, the tension on the sutures was so great that they gave way on the fifth day, and the borders of the wound healed by granulation.

In operating on patients with a thick layer of adipose tissue hereafter, the reporter said he would advise to dispense with the suture and allow the part to close by the slower process of granulation, as in such cases the suture gave much pain, and was sure to work its way out.

Dr. Manley advised the McBurney method for every form of *strangulated hernia*, whenever or wherever found, and said that if done early, by one familiar with the anatomy of the parts, under strict antisepsis, every case should be saved, for, unlike any procedure yet advised, with it we could not only relieve the strangulation, but promise the patient a permanent cure of his hernia.

He said that in this operation we eliminated the two great dangers always to be feared with the older methods, viz., septic infection and haemorrhage. The parts, being thoroughly exposed, could be completely relieved of any taint, and, with the deeper structures immediately accessible, extensive haemorrhage was impossible. The operation was indeed

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of a most revolutionary character, and was naturally approached with timidity by those who had not tested its simplicity and great efficacy in relieving a condition which Bryant[1] says is attended with a mortality of more than fifty per cent. when sought to be relieved, even in the hands of the most experienced operators.

Dr. GEORGE S. HUNTINGTON said that he had had a certain amount of experience with this operation from being associated with Dr. McBurney at the Roosevelt Hospital. The McBurney operation was especially satisfactory when performed for the relief of strangulated hernia, since, in addition to saving the patient from impending death, it afforded an excellent chance of a radical cure of this trouble. Among the particular advantages of the procedure were the open wound, with its facilities for antiseptic treatment, and the total obliteration of the sac. As to the approximation of the integument and the deeper structures,—the conjoined tendon of the internal oblique and transversalis above and the transversalis fascia below,—it was for the purpose of more readily accomplishing this that Dr. McBurney advocated the passage of lateral tension sutures. If the two lateral tension sutures took in at first little but the integument, there was not likely to be much difficulty, and the careful adjustment of these tension sutures had thus far given very satisfactory results. He said he should be somewhat afraid of leaving so large a wound without any sutures, for the reason that, on account of its large size, there would seem to be a probability of the cicatrix being rather weak.

Dr. J. G. TRUAX said that he had the opportunity of being present at Dr. Manley's operations, and the results obtained certainly seemed very gratifying to him. The McBurney operation appeared to be a decided improvement over every other with which he was acquainted. It had been his lot to operate for strangulated hernia a few times before this method was known, and he could only say that he would have considered it a great boon had such a procedure been at his disposal.

Dr. S. T. ARMSTRONG said he had noticed one point in Dr. Manley's paper which he thought called for comment, and that was the use of silk ligatures. Personally he had always employed catgut, because it was non-irritating and readily absorbed. Another point worthy of notice was in regard to congenital hernias. In a case of his own there was no spermatic cord present, but there was a mass of omentum. There the testicle was in an apparently normal condition, and it was an absolute impossibility to ligate the sac. Under the circumstances, therefore, the sac was made as tense as possible; but he could hardly hope for a successful result, as he did not have the patient's consent to remove the testicle. He would like to inquire whether Dr. Manley would feel justified in performing castration in such a case.

[1] Bryant's Prac. of Surg., 3d ed., p. 307.

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Dr. MANLEY said that, as he had stated in his paper, different cases required different modifications of the operation. As to the character of the suture, catgut was very unreliable. When the surgeon returned the omentum to the abdominal cavity he wanted to feel sure that his ligature would not stretch or slip or allow bleeding, and, personally, he did not feel safe unless he used silk. It was true that catgut was non-irritating and readily absorbed; but when something which was strong and would not become displaced was wanted, there was nothing like silk.

Dr. ARMSTRONG explained that he referred to the ligature applied to the sac.

Dr. MANLEY said that he would not mind a little irritation about the stump of the sac, because there was an open wound to deal with. As to the removal of the testicle, he would not do this without first explaining to the patient that this might be necessary for the successful completion of the operation. If the patient were assured that he would have complete virile power with the testicle remaining, he would not be apt to refuse his consent to its removal if it proved necessary.

Dr. TRUAX made a motion, which was unanimously carried, that a committee be appointed by the chair to confer with the Board of Health with a view to securing a more perfect registration of the births than is now made in the city of New York.

At the June or last meeting of the Association for the season there was a full attendance and an unusually interesting meeting. Papers were read by E. G. Janeway and J. Lewis Smith, constituting the main features of scientific interest.

Dr. JANEWAY on "The Diagnosis and Treatment of Basedow's Disease," in which he said he desired to present some points derived from his personal observation in a considerable number of cases. When well developed, and presenting all the well marked features characteristic of it, exophthalmic goitre could be readily recognised by anyone; but the case was very different in the incipiency of the disease. At the beginning of the disease the general health of the patient was more likely to attract the attention of the observer, and thus mask the real cause of the trouble. He thought it advisable, if possible, to avoid the use of such agents as opium, as sooner or later the nutrition would be impaired, and it was of the highest importance that it should be maintained as perfectly as possible. He had met with cases where strophanthus and other appropriate remedies produced no effect so long as the nutrition was impaired; but when this had become improved the distinctive features of the disease began to improve under their use. There were, however, certain cases of Basedow's disease attended with rapidity of the heart's action, in which nothing acted so efficiently in controlling this symptom as opium.

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Dr. SMITH's paper was devoted to the subject of "Tetany in Infancy and Early Childhood." Having given a *résumé* of the literature of the disease from the time it was first taken up by the French writers in 1831, he stated that the term "tetany" is applied to an affection which is characterised by tonic contraction of the muscles, commonly those of the extremities, but sometimes those also of the face and trunk, produced by causes external to the nervous system, and usually of temporary duration. Tetany may occur at any age of life, but is more frequent in childhood and early life. As a rule, there seems to be no hereditary predisposition, only in some families a neuropathic tendency. Nearly all writers assign as the most common cause derangement of the digestive organs. Diarrhœa, constipation, indigestible articles of food, over-eating, etc., seem to play the most important rôle in its causation. There is no recorded instance where lumbrice or ascarides caused the tetany; but Gowers alludes to three cases caused by tape-worms. Dentition is seldom a cause of the affection.

Dr. Smith then gave a clinical picture of the disease. Ordinarily tetany occurs without any marked premonitory symptoms; but in some instances it is preceded by pain in the head or spine, vomiting without any previous indigestion or gastric disturbance, and a general feeling of indisposition. The tonic contractions occur suddenly, and sometimes simultaneously, in the upper and lower extremities. At first a feeling of stiffness is experienced, and this is followed by the tonic contraction, with the fixation of the affected part in a state of permanent flexion or extension.

In the treatment Dr. Smith says the bromides are the most important remedies.

C. S. WOOD, M. D.,
President.

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ANNUAL REPORT OF THE COUNCIL

AND

MINUTES OF THE SESSIONS OF THE COUNCIL,

FOR THE YEAR 1889.

The Council met in annual session at the residence of the President, Dr. Lusk, No. 47 E. 34th street, New York city, on September 24, 1889, at 8:30 o'clock P. M.

Present: The chairman, Dr. Lusk, and Drs. Carroll, Clark, Ferguson, Gouley, Hinton, Strong, Taylor, and Truax.

The Secretary reported the following candidates, as having been appointed Fellows by circular vote, viz.,—

T. Floyd Woodworth, Benjamin F. Ochs, George Hudson, A. C. Kniskern.

The following applicants were then appointed Fellows, viz.,—

Edward K. Dunham, Wm. Marvin Bemus, John L. Eddy, R. T. Ralph, Nelson G. Richmond, P. Stockschlaeder, Rutson Maury, H. B. Swartwout, F. A. McWilliams, Frank G. Gow, F. A. Palmer, N. B. Johnston, Edwin Crocker, E. Potts, J. E. Janvrin, George Knipe, F. G. Kneer, S. E. Milliken, Francis F. Marshall, and Nathaniel M. Donahue. Three applications were laid upon the table.

The Secretary then presented a memorandum of the experience of the past year, and, from his suggestions, he was directed to prepare an addition to the by-laws, creating a retired list for those Fellows who, by reason of age or infirmity, have ceased to practise medicine or surgery, and who may wish to be entered thereon.

It was also voted that section four of article six of the by-laws shall be interpreted so as to allow the Treasurer to serve the appropriate notice on those in arrears for dues, at any time after three years' arrearages, as well as during the last month of the third year.

The Secretary was also directed to introduce at the meeting of the Association a resolution authorising the Council to remit or otherwise arrange arrearages of dues, when said arrearages had resulted from sickness or financial disaster.

A bill of the Librarian for $9.45 for disbursements was audited, and directed to be paid; also a bill of $3.50 for a blank book.

By resolution, the Treasurer was directed to keep the library insured.

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The Treasurer then made a partial report, the full report to be presented to the Association.

The Secretary reported the receipt of two thousand dollars for the library, as a bequest by our deceased Fellow, W. C. Pryer.

The Director of the Library then reported as follows:

FIFTH ANNUAL REPORT OF THE LIBRARY COMMITTEE OF THE NEW YORK STATE MEDICAL ASSOCIATION, SEPTEMBER 24, 1889.

The Library Committee ask leave to present their fifth annual report. Last year the committee reported 7,240 volumes. Since then, 610 volumes have been contributed by Dr. Carroll, Dr. Denison, Dr. Dubois, Dr. Flint, Dr. Ilgen, and the late Dr. Pryer, by several medical societies (Transactions in exchange), and by the surgeon-general U. S. army (Index Catalogue of the Medical Library in Washington).

The following summary, furnished by the acting librarian, Dr. E. S. F. Arnold, indicates the number of volumes at present in the library.

Volumes of books and journals, including Dr. Taylor's library, as reported in 1888, ...	7,240
Volumes received since the last report, ...	610
Total number of volumes in the library, ...	7,850

The acting librarian reports that many volumes of journals are still incomplete, but that these are not included in the count.

Owing to the over crowding of the library hall, it has become necessary to store the duplicates in an adjoining room.

The thanks of the committee are due to Dr. Arnold for his continued efforts in behalf of the library, especially for his very efficient work on the catalogue of the books, journals, and duplicates, and for so arranging the pamphlets that they can now be used to advantage.

J. W. S. GOULEY,
Director of the Library and Chairman of the Committee.

On motion, the report was accepted, and the Council adjourned.

E. D. FERGUSON, *Secretary.*

The Council met in called session at 5 o'clock P. M., at the Hotel Brunswick, on September 25, 1889, with the chairman, Dr. Lusk, presiding.

Present: Drs. Ayres, Carroll, Clark, Ferguson, Gouley, Hinton, Lusk, Strong, and Truax.

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On motion, the following applicants were appointed Fellows, viz.,—

Henry B. Reed, George E. Bellows, Ralph A. Seymour, John P. McGown, and John F. Erdmann.

The following were then duly nominated for Honorary Fellowship, the nominations to lie over one year, under the rule:

Henry O. Marcy, M. D., Boston, Mass., recommended by Drs. Didama, Lusk, and Ferguson; Sir John Simon, K. C. B., London, England, recommended by Drs. Carroll, Clark, and Gouley; William Goodell, M. D., Philadelphia, Penn., recommended by Drs. Lusk, Clark, and Truax.

Adjourned.

E. D. FERGUSON, *Secretary.*

The new Council met, after the close of the annual session, at the Hotel Brunswick, in New York city, on September 27, 1889, at 4:30 o'clock P. M., the chairman, Dr. Orton, presiding.

Present: Drs. Arnold, Carroll, Ferguson, Gouley, Hinton, Orton, and Truax.

The following applicants were appointed Fellows:

Fred J. Tompkins, A. B. Willis, Wm. P. Bemus, Harris C. Rodgers, Francis V. White, and Geo. Douglas.

On motion, the seventh annual session was appointed to open in New York city on Wednesday, October 22, 1890.

Drs. Arnold, Gouley, and Truax were appointed a committee to confer with a similar committee from the New York County Medical Association in relation to the care of the library and a place for future meetings, to report to the next meeting of the Council, and with power to add to their number.

The members of the Council residing in the Fifth District were then appointed the Committee on Publications, with power to appoint an editor for the forthcoming volume of Transactions.

A bill of Angell's printing-office, for $71.47, for programmes, postage, etc., was then audited, and the Treasurer authorised to pay the same.

The members of the Council for the Fifth District were then constituted a Committee of Arrangements for the seventh annual meeting, with Dr. Truax as chairman, and with power to add to their number.

The Secretary and Treasurer were authorised to take action in adjusting the accrued dues in cases of needy and worthy Fellows.

The Council then adjourned.

E. D. FERGUSON, *Secretary.*

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ISAAC E. TAYLOR, M. D.

OBIT OCTOBER 30, 1889.

On motion of Dr. Carroll:

The Council of the New York State Medical Association sadly records its unfeigned sorrow for the loss of a valued Founder, Fellow, and late President, endeared by his personal qualities as he was admired for his scientific attainments.

An illustrious name is transferred from the active list to the roll of honour of those who have bravely borne themselves in the foremost rank, and fallen triumphant.

Untiring in industry, wise in counsel, affectionate in friendship, steadfast in religious faith, beloved by his associates, and revered by the profession, which acknowledged him as one of its leaders, Isaac E. Taylor lived an example for emulation by his survivors and successors, and rests from his labour leaving a reputation unassailed by enmity, and beyond the reach of jealousy.

By the Council,

J. G. ORTON, M. D., *President.*
E. D. FERGUSON, *Secretary.*

The Council met in special session at the Mott Memorial Library, 64 Madison Avenue, New York city, on December 17, 1889, at 8:30 o'clock P. M.

Present: Drs. Ayres, Biggam, Carroll, Ferguson, Gouley, Harvie, Klock, Truax, and Wilson.

The following applicants were duly appointed Fellows, viz.,—

Crawford Elsworth Fritts, S. R. Welles, Thomas J. Barton.

The following communication was received from the trustees of the Mott Memorial Library, to wit,—

"The Mott Memorial Library, having been founded for the promotion of the best interests of the medical profession, it is desirable that a coalition be effected with a representative professional organisation; wherefore the trustees present to the New York State Medical Association, through its Council, the following propositions:

"1. That the library and museum of the New York State Medical Association, with all future additions thereto, be placed in the same building with the Mott Memorial Library, the joint collection of books to be used as one library, but to be shelved separately, and properly indicated on the cases.

"2. That the Mott Memorial Library constitute the place of meeting for the New York State Medical Association, its Council, and committees,

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and for such other medical and scientific organisations as may be allowed from time to time to meet there by the trustees of the Mott Memorial Library.

"3. That no indebtedness affecting the New York State Medical Association shall be incurred by the trustees of the Mott Memorial Library, nor *vice versa.*"

The foregoing was adopted at a regular meeting of the trustees of the Mott Memorial Library, held on December 6, 1889.

A. L. CARROLL, *President.*
GLOVER C. ARNOLD, *Secretary.*

Upon motion, it was unanimously voted that the Council of the New York State Medical Association accept the foregoing propositions of the trustees of the Mott Memorial Library.

In order to make the acceptance effective, it was resolved,—

1. That our library and museum be placed in the Mott Memorial Library building.

2. That our library and building fund, and all future additions thereto, be used for the benefit of the joint library thus formed.

3. That an annual appropriation of not less than one hundred dollars be made from the general fund of the Association toward the maintenance of the building and joint library under the direction of the trustees of the Mott Memorial Library.

4. That the net profits of any public lectures, or classes, held under the auspices of the Association, shall be devoted to the maintenance of the collective libraries in the Mott Memorial Library building.

The Committee of Conference, appointed at the last meeting of the Council, was then discharged without a report, and reäppointed as the Library Committee, it being constituted of Drs. G. C. Arnold, Ferguson, Gouley, Shrady, Truax, and the president, *ex officio.*

It was then resolved that the library and building fund, with all future additions thereto, be turned over to the treasurer of the Library Committee, to be invested according to the existing by-laws of the Association, and that the said committee be authorised to appoint its treasurer.

It was further voted that the Library Committee be authorised to draw upon the library and building fund for the removal of the library to the Mott Memorial Library building, and placing the books and cases in proper position and condition, but that after said removal the said committee can only use the income from the library and building fund, and that no part of the principal of the same shall be used without the special authority of the Council.

The following special report on the library was then made:

The library of the New York State Medical Association now contains about eight thousand volumes and five thousand pamphlets; the latter,

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with very few exceptions, having been contributed by Fellows of the Fifth District.

Of the 8,000 volumes, 6,800 are bound, and 1,200 are in sheets or stitched ready for binding.

Of the 6,800 bound volumes, 5,626 were contributed by Fellows of the Fifth District, and 1,174, or less than one fifth, were contributed by Fellows of the other four districts.

Of the 1,200 volumes in sheets, not less than seven hundred were contributed by Fellows of the Fifth District: the remaining five hundred consist of contributions from the surgeon-general of the army, the surgeon-general of the navy, and the supervising surgeon-general of the marine hospital service, also of exchanges of Transactions with many state medical associations, and from other sources. A small proportion only of these twelve hundred volumes have been contributed by Fellows of the other four districts.

J. W. S. GOULEY, *Director of the Library.*

The following was then adopted:

Resolved, That the Council of the New York State Medical Association, in furtherance of Article I, section 2, *second*, of the constitution of the Association, do hereby direct and authorise the committee to institute courses of public lectures, to be delivered by such persons as the committee may select, and at such times and places as the committee may deem expedient.

Resolved, That this committee be authorised to procure the services of eminent scientific men as lecturers, and to suitably remunerate them out of the proceeds of such public lectures, without calling upon the Association for any pecuniary disbursement.

Resolved, That these lectures shall embrace the widest range of scientific investigation, leading to hygiene and public health.

Resolved, That the committee be authorised to appoint such sub-committees as may be required to carry out the object specified in the preceding resolutions.

The following proposed additions to Article II of the constitution were presented, and entered on the minutes:

SECTION 11. The Council may, at any time, appoint, as Fellows of the Association, physicians, in good standing, residing in other states, in the British Provinces, or in other neighbouring countries, provided that these physicians subscribe to the code of ethics of this Association, and provided that each candidate be endorsed by two members of the Council. Fellows thus appointed shall be styled non-resident Fellows.

SECTION 12. Non-resident Fellows shall have all the privileges of resi-

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dent Fellows, except that they shall not be eligible to any office in the Association, and that they shall not have the right to vote in the meetings of the Association. Non-resident Fellows shall not be required to pay any initiation fees; they shall not be subject to assessments; but they shall pay annual dues of five dollars, and receive, gratis, a copy of each year's Transactions of the Association.

On motion, it was voted that, in the opinion of the Council, it is desirable that, at the regular meetings of the Association, annually, biennially, or at other intervals, as the Committee of Arrangements or the Council, by future action, may find practicable, some action be taken commemorative of Valentine Mott and his services to surgery.

The minutes being approved, the Council adjourned.

E. D. FERGUSON, *Secretary.*

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MEMOIR OF GEORGE W. AVERY, M. D.

BY LEROY J. BROOKS, M. D., OF CHENANGO COUNTY.

Dr. GEORGE W. AVERY was the fourth child and second son of William and Hannah Avery, and was born in Sherburne, March 9, 1827. His early education began in a district school, and when ten years old he began attendance at the Sherburne academy, where, while he did not graduate, he studied the classics and higher mathematics.

In the fall of 1846 he commenced reading medicine with Drs. Devillo White and E. L. Lyman. In 1848 he went to Albany, and remained there as a student and assistant of Drs. Allen March and James H. Armsby until his graduation in January, 1850.

He commenced practice in partnership with Dr. William B. Reid, of Rochester, one of the oldest and most brilliant of the medical fraternity, and who, it will be remembered, was the originator of the Reid method of reduction of dislocations of the hip joint by manipulation and rotation. The partnership continued two years, Dr. Reid then going to New York, and Dr. Avery remaining in Rochester.

In 1861 he was commissioned as assistant surgeon of the 13th Regiment N. Y. S. V., and served with the regiment on General Porter's staff as detached officer until September 24, 1862, when he was promoted to the rank and commission of surgeon of the 94th Regiment N. Y. S. V. Immediately upon joining that regiment, he was placed in charge of all hospitals in General Franklin's grand division of the Army of the Potomac, and remained in that service until March 12, 1863, when the 94th Regiment was consolidated with the 105th N. Y. S. V. This consolidation mustered him from service, and he returned to Rochester; but he was immediately placed by General Quackenbush as surgeon of the 11th N. Y. S. V., and entered the service again on the 24th of June, the regiment being ordered to Harrisburg, Pa. On the 10th of July the regiment was ordered to Fort Hamilton, New York harbour; and, on priority of commission, he became surgeon at that fort. He remained in this position until January, 1864, when the regiment was consolidated with the 4th N. Y., and he was mustered out of service at his own request. During the preceding April he was one of the staff of five surgeons appointed by Governor Seymour as examiner of candidates for state bounty of $250.

On the 8th of March, 1865, he resumed the civil practice of medicine at Norwich, N. Y. He joined the Chenango County Medical Society in 1865. In 1866 he was elected treasurer of the society, and held the posi-

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tion, except during the year 1878, when he was made president of the society, until the time of his death. In 1870 he was elected delegate to the State Medical Society, and was made a permanent member in 1877. In 1883 he became one of the charter members of the New York State Medical Association, and was the only Founder from Chenango county. In 1885 he was chosen a member of the council of that Association, and in 1886 was made one of the vice-presidents, which constituted him president of the district branch.

Dr. Avery was one of the coroners of Chenango county for twelve years, and was a pension examiner for fifteen years.

He was a Mason, and held many positions of honour and trust in that fraternity.

He married, on the 7th of June, 1854, Miss Elizabeth Flower, of Rochester, who lived but about two years after their marriage, dying July 26, 1856. He was again married August 12, 1863, being united then with Mrs. Martha Clark, a sister of his former wife. He had no children.

In May, 1877, he became a member of the Norwich Congregational church, under the pastorate of Samuel Scoville.

It would be presumptuous for me to say anything of a man who had a record like the one just given of Dr. Avery. The recognition of the value of his services by the government, the honours extended to him in various civil capacities, and the exalted positions that he held in the medical societies in which he had membership, all become of themselves a memorial without further words, and indicate that he possessed exceptional ability and worth.

I will read the following letter from Dr. Joseph D. Bryant:

No. 54 West 36th Street,
New York, May 23, 1889.

Dear Dr. Brooks: You wish me to write you a letter expressive of my "impressions concerning the good qualities of the late Dr. Avery." While it is painful to me to recognise the occasion for such an act, still it is none the less a pleasure for me to be able to speak in the highest terms of commendation of one who, by reason of being nature's debtor, will soon become a part of the earth which his presence graced. The testimony that establishes the fact that one has not lived in vain is the most worthy and enduring legend that can mark the resting-place of the dead. I can say that which but few can say,—I knew him most intimately for three years. He wisely directed the course of my medical education, and at the end of this time most generously gave his name and influence to the advancement of my additional desires. The estimate that I had formed of his natural ability and of the genuineness of his friendship, was never dimmed in the least by association with newer acquaintances and with the medical and surgical minds of a more extended sphere than that in which he moved. One without a friend, even though he be wealthy in possessions and family traditions, is a pauper indeed, if not a thief of time and air; but one having such friendships as Avery bestowed, though poor in purse, could be accounted rich in highest resources. You, I, and

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all of us lost a friend when Avery died. The profession, too, that takes but passing note of the death of even those whom the world calls great, has suffered its affliction. We are not alone, however, in our sorrow, for the blow that deprived us of a friend and an honourable associate, robbed the wife of a loving husband. . . . . The living should profit by the examples of those who have died. Let us, therefore, emulate the virtues of our late friend, and while we remember that he was, as each of us now is, imperfect, let us not forget that he who recognises his own weaknesses and conquers them in himself, while he excuses them in others, is greater and better than he who, while wrapping himself closely around in the robes of self-sufficient sanctimoniousness, claims to be righteous in all things.

Very sincerely yours,

JOSEPH D. BRYANT.

Dr. Avery was what might be called a "gentleman of the old school." No man enjoyed the social part of life better than he, and at the various medical gatherings he drew to himself a large circle of friends, who were attracted by his genial way, his whole-souled hospitality, his keen powers as a conversationalist.

Rev. H. A. DeLano wrote of him, after having enjoyed his acquaintance for some time,—"He is a veritable Ben Jonson. He possesses a wealth of wit and philosophy—a world of flashing jest and repartee as sharp as any lance he ever lifted or used." He was well qualified, both by nature and acquired knowledge, to practise medicine and surgery. As a physician, he was intuitive, made a quick and nearly always a correct diagnosis, and was successful in treatment. As a surgeon, his large hospital and army experience, as well as his school training under Drs. Armsby and March, made him bold almost to recklessness, skilful with unfailing nerve, cool in emergencies; and while, as surgeons are apt to be, he was sometimes accused of roughness, he was tender and careful of his patients, and had a large record of successful operations and surgical procedures.

The character of the man could not have been better shown than by his bearing during the terrible ordeal of his last sickness. He had an epithelial cancer of the lip. This he assiduously concealed from even his nearest friends until it had reached a size too great for concealment. Then, firmly believing and frequently expressing the opinion that there was no hope of recovery, at the solicitation of those near to him, who felt that they could not let him die without an attempt to save him, he submitted to operation after operation—first of the lip, then of one gland after another—until even the most courageous of New York surgeons would not go farther. He then kept about, bidding one friend or patient and another good-bye, never complaining, meeting jest with jest, smile with smile, in a most heroic way—personally making every arrangement for the final care of his body and property, settling all his business—the greatest thought being to relieve the dear and faithful wife from every

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present and future burden—insisting upon caring for himself and dressing the now terrible sore, until the exhaustion of the body compelled him to take the bed, and let his friends extend to him the few, sad kindnesses and attentions that they could offer.

His death occurred on the first of November, 1888; and he was buried at Rochester, N. Y.

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MEMOIR OF ROBERT H. SABIN, M. D.

BY E. D. FERGUSON, M. D., OF RENSSELAER COUNTY.

Dr. ROBERT H. SABIN died at his home in West Troy, on December 4, 1888. He was born at Saxton's River, Vermont, in 1832, and pursued his medical studies at Dartmouth and the Albany Medical College, graduating at the latter institution in 1856. He began the practice of medicine at Poestenkill, in Rensselaer county, New York, but removed in 1859 to West Troy, where he resided and practised his profession until his death. In 1860 he married Miss Margaret Andrews, who survives him. Their only child, Dr. William B. Sabin, is a member of our Association, both the father and son having been among its Founders.

It had been the writer's privilege to meet the deceased quite frequently in consultation and otherwise from 1878 to the time of his death, and it gives him pleasure to bear witness to the ability, skill, and unselfishness with which he pursued his vocation. The "personal factor" was never apparent in his consideration of his cases, so that a consultation could always turn solely on the condition and needs of the patient.

The possession of excellent general health enabled him to discharge the duties connected with a large *clientèle*, and his ability to recognise the essential features of individual cases of illness and expeditiously meet the indications enabled him to care for a large number of patients. In the language used in a memoir of him by Dr. Van Vranken, "he was endowed to a remarkable degree with that rare faculty which so many medical men covet but which few possess, viz., an ability to combine the tender solicitude of the faithful nurse with the skill of a physician without a corresponding loss of dignity by the rendition of a menial service." He had an instinctive ability in the detection of shams or frauds in professional work, and a profound and abiding respect for and belief in honest medication and honest professional workers.

He will be especially remembered by many of our Fellows, who only met him at the Association meetings, for his deep interest in all matters relating to biliary calculi, he having been repeatedly subjected to the pains of hepatic colic. It will be interesting to many of you to know that his death resulted from gall-stones.

In the autumn of 1877, the writer attended him during an attack of cholecystitis (without jaundice) when the propriety of cholecystotomy was discussed, and, though he manifested a readiness to undergo the operation if thought advisable, as the distention of the gall-bladder and

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the attendant fever and discomfort soon subsided and his usual good health returned, it was mutually considered unjustifiable.

Two days before Dr. Sabin's death the writer was again called to see him. The evidence then pointed to a rupture of the gall-bladder, though the pain had somewhat simulated that of angina pectoris.

The shock was so profound that it was necessary to reply in the negative to the courageously expressed question of the patient as to whether it would be proper to perform a laparotomy. He fully appreciated the difficulties in the way of such a procedure, and bravely accepted the inevitable result. It was a gratification to find by an autopsy that the withholding of laparotomy was the wiser course. There were two ruptures of the gall-bladder, one on the hepatic attachment, which probably occurred a year before his death, at the time of the cholecystitis previously noted, and resulted in the sacculation of a number of gall-stones in a pocket between the gall-bladder and the liver, and a recent rent that had determined peritonitis, shock-collapse, and death. One hundred and fifty-three gall-stones of varying size were found in the gall-bladder, the sac probably formed in 1887, and in the inflammatory exudation around the seat of the recent rupture.

The situation of the extended gall-stones was such as to have precluded the possibility of their detection and removal, or the establishment of adequate drainage without a degree and extent of disturbance of important organs that would inevitably have resulted in a fatal issue during the procedure. The shock and the resultant collapse were so profound as to justify the opinion that even a slight operative procedure would result in a prompt cessation of the already flickering action of the heart, but the autopsy demonstrated that no duty had been omitted.

Dr. Sabin lived, worked, and died the life, work, and death of an honest man, true to his profession, his friends, and his convictions.

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MEMOIR OF JOHN SUMMERFIELD ANDREWS, M.D.

BY R. M. WYCKOFF, M. D., OF KINGS COUNTY.

JOHN SUMMERFIELD ANDREWS was born at Bethel, Conn., in 1829; died at his home on Pennsylvania Avenue, Brooklyn, January 3, 1889. When only 20 years of age he obtained his degree in medicine at the University of New York, class of 1849. Almost immediately after graduating Dr. Andrews settled in East New York, which at that time was little more than a straggling country village, but which is now a progressive ward in the city above named. The outlook was not especially cheering, and he began his rounds of practice on horseback. He worked patiently and diligently in three or four of the county towns and in the outlying districts of the adjoining city, and, growing up with the town, he in time built up one of the largest practices ever acquired on Long Island. For many years he stood almost alone as the physician of his town, almost the only regularly educated and eminently capable man in his vicinity. His name was a "household word" throughout a very extensive circuit. He was for many years the health officer of the town, and it was his pride to do thoroughly the sanitary and registration work of that office. He took an interest in medical society progress, although he could not attend the meetings frequently, especially in the American Medical Association and in the State Association, of which latter he was one of the original members. He was warmly enlisted in the growth of St. Mary's Hospital, located not very far from his home, and was a member of its surgical staff up to the time of his final illness. About five years ago his health began to fail, and he withdrew from active practice little by little, a progressive impairment of the lung-power and of his general vigour rendering it more and more difficult for him to get about and to ascend stairs. His mind was clear, active, and interested up to the very last.

It is a privilege to have known Dr. Andrews and to have had his friendship. His was a sturdy, manly nature. Self-reliant and at the same time cordial and helpful, his profession was well chosen, and he illustrated the beneficent aspect of the physician's life-work for nearly forty years in a community for which he was admirably adapted, and whose respect and honour for him only ripened as the years passed by.

Like many another physician he was greatly trusted and consulted in affairs outside of medical practice, in emergencies and troubles for which not poppy nor all the drowsy syrups of the East are called for, but sound

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judgment and counsel. On one occasion he said, "Why, I have a church in my house every day," as if his office were a confessional. The good which is done by such a physician is simply incalculable, and any community is blessed when such a one casts in his lot with them. It will be many a long day before the name of Dr. Andrews shall cease to be mentioned as that of the good and tried friend in a hundred households.

In his will, Dr. Andrews left to St. Mary's Hospital his medical library and a sum of money.

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MEMOIR OF ISAIAH H. ASHTON, M. D.

BY R. J. SOUTHWORTH, M. D., OF WESTCHESTER COUNTY.

By the death of our late Fellow, Dr. I. H. ASHTON, of Irvington, Westchester County, we have lost an earnest supporter of the cardinal principle of our Association. Prevented by ill-health from taking an active part in the transactions of our meetings, he nevertheless displayed his loyalty to the Code of Ethics of the National Association in all his professional relations.

Dr. Ashton was the third child and third son of the late Joseph Ashton and his wife, Mary Heylin Ashton, and was born at Philadelphia, Penn., on the 12th of November, 1849. Dr. Ashton was of English descent, and his American ancestry can be traced back to the colony that settled Pennsylvania under William Penn. His great-grandfather and Fenimore Cooper were first cousins, and were brought up together.

Owing to his weak constitution, his early education was conducted by private tutors and in private schools. In accordance with the wish of his father, who desired that he should become a physician, he entered the office of his preceptor, Dr. Napoleon Hickman, demonstrator of anatomy of the University of Pennsylvania, in whose house he lived during the first year of his medical studies. He then went West for a short time for his health. On his return he resumed his medical studies, and was graduated in the class of 1870 at the University of Pennsylvania.

After graduation, before he settled down to the practice of his profession, Dr. Ashton travelled extensively through this country, and finally settled in Shepherdstown, West Virginia, on account of his father's health. After living here about three years, his father died, in 1874.

After his father's death he returned to Philadelphia, and entered the Pennsylvania Hospital, where he served for one year. He then went to St. Paul, Minnesota, where his family had settled, and entered the office of Dr. Hand. Here he met Miss Kate Thompson, the second daughter of Mr. James E. Thompson, president of the First National Bank of St. Paul, to whom he was united by marriage on December 18, 1877. After travelling about the country, and a visit abroad for six months, he returned to America, and settled at Irvington, Westchester County, New York, in 1882, where he devoted himself to the practice of his profession.

Dr. Ashton's practice was interrupted by his ill-health, which necessitated frequent visits South during the winters. In 1887 he went to the south of France with his wife in the hope that the change might be beneficial. Notwithstanding his feeble health, Dr. Ashton was an ambitious and enthusiastic physician. Independent of his practice as a means of living, his enthusiasm was prompted by his love for his profession and his

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charitable instincts. I was told by one unconnected with his family, and who could not know the object of my inquiry, that Dr. Ashton did a large amount of charitable work among the poor of his vicinity. The amiability of his character is illustrated by his love for the lower animals, especially horses and dogs. He owned some very valuable horses and fine dogs. When in Naples he was so disgusted by the cruelty of the native drivers of vehicles to their horses that he told his wife he would never ride in one of their carriages, but would do all his travelling about the city on foot. He fondly hoped that a society for the prevention of cruelty to animals would be established in Naples, and was ready to help such an institution.

The circumstances of Dr. Ashton's death are as follows:

At about nine o'clock on the morning of Friday, the 8th of February last, he was driving toward the railroad station at Dobbs Ferry in the wagon of a man who had been doing some work at his house, when the horse became unmanageable. While endeavouring to avoid collision with two vehicles coming in the opposite direction, he and his companion were thrown upon the hard, frozen road. His companion escaped with a fracture of the forearm and a few slight flesh wounds, from which he finally recovered. Dr. Ashton did not seem to be hurt much. He arose and entered a hack, and was driven to the office of Dr. C. H. Judson. Not finding the doctor in he was driven to his home, and immediately went to bed. Dr. Judson called a few hours later, and found that there were only a few slight flesh wounds on the face and scalp. He sewed up the wounds and dressed them, and left his patient doing apparently well. The patient was afterwards seen by Dr. R. B. Coutant, of Tarrytown, a Fellow of our Association. On Wednesday, the 13th, the sutures were removed, and everything seemed to be going on well. On the 14th a medical friend (whose name I neglected to ascertain) was called in from New York city. Upon examination the lips of the scalp wound were found separated, and symptoms of a slight meningitis manifested themselves, but no injury to the bone could be determined or depression detected. Pain and dulness on the right side just below the border of the liver, and slight febrile symptoms, indicated a localised peritonitis. The peritonitis extended and became general. On Saturday, the 16th, Drs. E. C. Seguin and Robert Weir were called in consultation. After a thorough examination it was determined that the patient was suffering from extensive peritonitis due to some internal injury, the exact nature of which could not be determined. Laparotomy was proposed by one of the consulting surgeons, but it was decided to be unadvisable.

Dr. Ashton died late Saturday night, the 16th of February, 1889, the eighth day after the accident. The cause of death was peritonitis. No autopsy was held. He left a widow in independent circumstances, but no children.

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MEMOIR OF E. J. SCHOONMAKER, M. D.

BY S. R. WELLES, M. D., OF SENECA COUNTY.

Ephraim Joachim Schoonmaker, son of D. W. and Lydia (De Puy) Schoonmaker, was born in Rochester, Ulster County, N. Y., November 27, 1824. His father removed to Tyre, Seneca County, N. Y., in 1835. The boyhood of young Schoonmaker was spent in agricultural work on his father's farm in the summer, and in attendance upon the district school in the winter, until 1843, when, with a view to a better preparation for the study of medicine—which he had chosen for his profession—he entered the Waterloo academy. Here he remained until, having completed his academic course, he commenced his professional studies with Dr. Jacob Hasbrouck, of Tyre, with whom he remained two years. He then spent a third year under the tuition of Dr. Landon Wells, at Waterloo, N. Y. In the year 1848 he graduated from the Geneva Medical College, and immediately thereafter located at Magee's Corners, in the town of Tyre, where he continued in active practice for a period of forty years. Dr. Schoonmaker was actively interested in the revival of the Seneca County Medical Society, and at the meeting for its reorganisation was made a member of the Board of Censors. He was three times chosen treasurer, was elected to the presidency in 1869, and held the secretaryship for a period of thirteen years, from 1876 to the day of his death, fulfilling in every relation with the society, faithfully and conscientiously, every obligation assumed.

Dr. Schoonmaker was present at the organisation of the Medical Association of Central New York in 1868 as a delegate from the Seneca County Medical Society, and in the same capacity participated in the formation of the State Medical Association. In May, 1886, he proposed and advocated the reorganisation of the County Medical Society, and the change of name to the Seneca County Medical Association, which was effected at the next meeting.

The health of Dr. Schoonmaker began to decline in the fall of 1887, and he was confined to his house during the entire winter of 1887–'88. Though he resumed practice to some extent during the subsequent summer, his health and strength were not regained. In July he was stricken with an acute inflammation of the bladder, which proved too severe for his already enfeebled system, and he died August 19, 1889.

This brief notice cannot be more fitly closed than in the words of the Memorial adopted by the County Medical Association upon the occasion

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of his burial:—"The record of his active practice in Seneca County extends over a period of time surpassing that of any of his associates. For forty-one years, in the home of his boyhood, he has toiled; and the fruits of that long period of professional study, observation, and experience were freely used for those coming under his care. During all this time his professional zeal never flagged, the sense of obligation to his patients was never dulled, his growth in the affection of the people to whom he was counsellor, guide, and friend, never diminished. Loyal to his profession, an able practitioner, earnest and self-sacrificing in the discharge of his every duty, true to his friends, his loss will be deeply felt by his brethren of the Association, by whom he was held in high professional esteem and personal regard."

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LIST OF FELLOWS.

BY DISTRICT AND COUNTY.

FIRST OR NORTHERN DISTRICT.

FRANKLIN COUNTY.

Founder.	Gillis, William.	Fort Covington.

1

FULTON COUNTY.

Original.	Blake, Clarence R.	Northville.
Founder.	de Zouche, Isaac.	Gloversville.
	Drake, D. Delos.	Johnstown.
	Edwards, John.	Gloversville.

4

HAMILTON COUNTY.

	McGann, Thomas.	Wells.

1

HERKIMER COUNTY.

	Casey, J. E.	Mohawk.
	Douglass, A. J.	Ilion.
	Ellis, J. B.	Little Falls.
	Fox, Eli.	Mohawk.
	Garlock, William D.	Little Falls.
Original.	Glidden, Charles H.	Little Falls.
	Green, H. H.	Paine's Hollow.
Original.	Potter, Vaughn C.	Starkville.
Original.	Sharer, John P.	Little Falls.
Original.	Southworth, Mark A.	Little Falls.
Original.	Young, John D.	Starkville.

11

JEFFERSON COUNTY.

Founder.	Abell, Ira H.	Antwerp.
Founder.	Crawe, J. Mortimer.	Watertown.

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Founder. Johnson, Charles M. Watertown.
Original. Johnson, Parley H. Adams.
Miller, J. H. Carthage.
5

LEWIS COUNTY.

Crosby, Alexander H. Lowville.
Douglass, Charles E. Constableville.
Joslin, Albert A. Martinsburgh.
Kelly, John D. Lowville.
Kilborn, Henry F. Croghan.
5

MONTGOMERY COUNTY.

Original. Ayres, Douglas. Fort Plain.
Original. Biggam, William H., Jr. Fort Plain.
French, S. H. Amsterdam.
Original. Graves, Ezra. Amsterdam.
Original. Johnson, Richard G. Amsterdam.
Klock, Charles M. St. Johnsville.
Original. Leach, H. M. Glen.
Parr, John. Buel.
Parsons, W. W. D. Fultonville.
Founder. Robb, William H. Amsterdam.
Original. Rulison, Elbert T. Amsterdam.
Simmons, Frank E. Canajoharie.
Smyth, Arthur V. H. Minaville.
13

ONEIDA COUNTY.

Armstrong, James A. Clinton.
Babcock, H. E. New London.
Original. Bagg, Moses M. Utica.
Barnum, D. Albert. Cassville.
Original. Blumer, G. Alder. Utica.
Bond, George F. M. Utica.
Original. Booth, Wilbur H. Utica.
Original. Brush, Edward N. Utica.
Churchill, Alonzo. Utica.
Clarke, Wallace. Utica.
Crim, Frank D. Utica.
Dodge, Amos P. Oneida Castle.
Douglass, James W. Booneville.

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English, G. P. Booneville.
Flandrau, Thomas M. Rome.
Fraser, Jefferson C. Ava.
Fuller, Earl D. Utica.
Gibson, William M. Utica.
Glass, James H. Utica.
Gray, John P. Utica.
Holden, Arthur L. Utica.
Hughes, Henry R. Clinton.
Original. Hunt, James G. Utica.
Kuhn, William. Rome.
Munger, Charles. Knoxboro.
Nelson, William H. Taberg.
Palmer, Henry C. Utica.
Palmer, Walter B. Utica.
Phelps, George G. Utica.
Original. Pilgrim, Charles W. Utica.
Founder. Porter, Harry N. N. Y. Mills.
Quin, Hamilton S. Utica.
Reid, Christopher C. Rome.
Roberts, John L. D. N. Y. Mills.
Russell, Charles P. Utica.
Spicer, Walter E. Holland Patent.
Sutton, H. C. Rome.
Sutton, Richard E. Rome.
Swartwout, Leander. Prospect.
Tefft, Charles B. Utica.
Wagner, Charles Gray. Utica.
West, Joseph E. Utica.
West, M. Calvin. Rome.

43

OSWEGO COUNTY.

Bacon, Charles G. Fulton.
Bates, Nelson W. Central Square.
Cooley, R. N. Hannibal Centre.
Original. DeWitt, Byron. Oswego.
Dowd, Pascal M. Oswego.
Original. Hall, William A. Fulton.
Huntington, John W. Mexico.
Johnson, George P. Mexico.
Marsh, E. Frank. Fulton.
Nelson, George W. Orwell.

27

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Todd, John B. Parish.
Original. Tully, A. Melville. Oswego.
12

ST. LAWRENCE COUNTY.

Cook, Guy Reuben. Louisville.
1

SECOND OR EASTERN DISTRICT.

ALBANY COUNTY.

Founder. Bailey, Theodore P. Albany.
Original. Houston, David W. Cohoes.
Founder. Peters, Samuel. Cohoes.
Founder. Sabin, William B. West Troy.
Original. Van Vranken, Adam T. West Troy.
5

CLINTON COUNTY.

Founder. Dodge, Lyndhurst C. Rouse's Point.
Original. Howe, Edwin S. Au Sable Forks.
Founder. Lyon, E. M. Plattsburgh.
3

COLUMBIA COUNTY.

Original. Benham, John C. Hudson.
Fritts, Crawford Ellsworth. Hudson.
Original. Lockwood, J. W. Philmont.
Original. Smith, H. Lyle. Hudson.
Founder. Wilson, Thomas. Claverack.
Woodworth, T. Floyd. Kinderhook.
6

ESSEX COUNTY.

Founder. Barton, Lyman. Willsborough.
Church, Charles A. Bloomingdale.
Original. D'Avignon, Francis J. Au Sable Forks.
Founder. *Edgerly, Edward F. Moriah Centre.
Original. LaBell, Martin J. Lewis.
Original. Pollard, Abiathar. Westport.
Original. Rand, Hannibal W. Keene.

* Deceased.

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Original. Rice, Isaac. Bloomingdale.
Original. Riley, Andrew W. Au Sable Forks.
Original. Robinson, Ezra A. Jay.
Original. Turner, Melvin H. Hammondsville.

11

GREENE COUNTY.

Original. Conkling, George. Durham.
Getty, A. H. Athens.
Huestis, W. B. Kiskatom.
Original. Selden, O. G. Catskill.
Original. Selden, Robert. Catskill.

5

RENSSELAER COUNTY.

Original. Allen, Amos. Grafton Centre.
Founder. Allen, Charles S. Greenbush.
Allen, William L. Greenbush.
Original. Baynes, William T. Troy.
Founder. Bonesteel, William N. Troy.
Original. Bontecou, Reed B. Troy.
Original. *Bucklin, Daniel D. Lansingburgh.
Founder. Burbeck, Charles H. Troy.
Founder. Burton, Matthew H. Troy.
*Case, M. W. Troy.
Original. Cooper, William C. Troy.
Founder. Cooper, William S. Troy.
Original. Crombie, Walter C. Schaghticoke.
Founder. Ferguson, Everard D. Troy.
Founder. Finder, William. Troy.
Greenman, C. E. Troy.
Founder. Hannan, James C. Hoosick Falls.
Founder. Harvie, J. B. Troy.
Original. Heimstreet, Thomas B. Troy.
Keith, Halbert Lyon. West Sand Lake.
Original. *Lester, Sullivan W. Troy.
Original. Lyon, George E. Troy.
Original. Magee, Daniel. Troy.
Marsh, James P. Troy.
Founder. Mitchell, Howard E. Troy.
Founder. Nichols, Calvin E. Troy.
Founder. Nichols, William H. West Sand Lake.
Original. Rogers, S. Frank. Troy.

* Deceased.

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Founder.	Rousseau, Zotique.	Troy.
Founder.	Seymour, W. Wotkyns.	Troy.
Original.	Skinner, Smith A.	Hoosick Falls.
	Sweetman, J. T., Jr.	Troy.
	Tompkins, Fred. J.	Lansingburgh.
Original.	Traver, Richard D.	Troy.
	Ward, R. H.	Troy.
	Willis, A. B.	Johnsonville.

36

SARATOGA COUNTY.

Founder.	Babcock, Myron N.	Saratoga Springs.
Founder.	Comstock, George F.	Saratoga Springs.
Founder.	Creal, Charles E.	Saratoga Springs.
	Curtis, P. C.	Round Lake.
Original.	Dunlop, John J.	Waterford.
	Gow, Frank F.	Schuylerville.
Founder.	Grant, Charles S.	Saratoga Springs.
Original.	Hall, William H.	Saratoga Springs.
Founder.	Hodgman, William H.	Saratoga Springs.
	Hudson, George.	Stillwater.
	Inlay, Erwin G.	Conklingville.
Original.	Johnson, Ianthus G.	Greenfield Centre.
	Keefer, Charles W.	Mechanicsville.
	Kniskern, A. C.	Mechanicsville.
Founder.	McEwen, Robert C.	Saratoga Springs.
	Moriarta, D. C.	Saratoga Springs.
Original.	Murray, Byron J.	Saratoga Springs.
	Palmer, F. A.	Mechanicsville.
Original.	Preston, John R.	Schuylerville.
Founder.	Reynolds, Tabor B.	Saratoga Springs.
	Rice, George.	Mechanicsville.
Original.	Sherer, John D.	Waterford.
	Sherman, F. J.	Ballston.
Original.	Stubbs, Roland H.	Waterford.

24

SCHENECTADY COUNTY.

	Ennis, Alexander.	Pattersonville.
	Fuller, Robert.	Schenectady.
	Hammer, Charles.	Schenectady.
Original.	McDonald, George E.	Schenectady.
Original.	Reagles, James R.	Schenectady.

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Steinführer, Gustavus A. F. Schenectady.
Original. Van Zandt, Henry C. Schenectady.
7

SCHOHARIE COUNTY.

Original. Hagadorn, William. Gilboa.
Original. Kingsley, Henry F. Schoharie.
2

WARREN COUNTY.

Original. Ferguson, James. Glens Falls.
Fitzgerald, David J. Glens Falls.
Original. Martine, Godfrey R. Glens Falls.
3

WASHINGTON COUNTY.

Lambert, John. Salem.
Long, Alfred J. Whitehall.
2

THIRD OR CENTRAL DISTRICT.

BROOME COUNTY.

Allen, S. P. Whitney's Point.
Founder. Chittenden, Joseph H. Binghamton.
Original. Ely, Henry Oliver. Binghamton.
Farnham, LeRoy D. Binghamton.
Farrington, John M. Binghamton.
Greene, Clark W. Chenango Forks.
Original. Hills, Lyman H. Binghamton.
Hough, F. P. Binghamton.
Knapp, W. H. Union Centre.
McFarland, S. F. Binghamton.
Meacham, Isaac D. Binghamton.
Moore, William A. Binghamton.
Founder. Orton, John G. Binghamton.
Pierce, Edward A. Binghamton.
Pierson, G. E. Kirkwood.
Founder. Putnam, Frederick W. Binghamton.
Original. Race, W. F. Binghamton.
Founder. Richards, Charles B. Binghamton.

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Seymour, Ralph A. Whitney's Point.
Wells, E. H. Binghamton.
20

CAYUGA COUNTY.

Original. Kenyon, M. Moravia.
Original. Laird, William R. Auburn.
Founder. Sawyer, Conant. Auburn.
Original. Tripp, John D. Auburn.
4

CHEMUNG COUNTY.

Original. Brown, Charles W. Elmira.
*Morrell, Isaac. Elmira.
Original. Price, John H. Elmira.
Original. Ross, Frank W. Elmira.
Squire, Charles L. Elmira.
*Squire, T. H. Elmira.
Original. Wales, Theron A. Elmira.
7

CHENANGO COUNTY.

Original. Blair, Louis P. McDonough.
Original. Brooks, Leroy J. Norwich.
Copley, Herman D. Bainbridge.
Douglas, George. Oxford.
Guy, John D. Coventry.
Hand, S. M. Norwich.
Hayes, Philetus A. Afton.
Original. Johnson, Leonard M. Greene.
Original. Lyman, Elijah S. Sherburne.
Original. Lyman, H. C. Sherburne.
Packer, Thurston G. Smyrna.
Smith, Samuel L. Smithville.
Thompson, R. A. Norwich.
Van Wagner, L. A. Sherburne.
14

CORTLAND COUNTY.

Bradford, George D. Homer.
Original. Clark, DeWitt. Marathon.
Didama, E. A. Cortland.
Founder. Green, Caleb. Homer.

* Deceased.

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	Halbert, M. L.	Cincinnatus.
Founder.	Hendrick, Henry C.	McGrawville.
	Higgins, F. W.	Cortland.
Founder.	Jewett, Homer O.	Cortland.
	Kenyon, Benjamin.	Cincinnatus.
Original.	Smith, Marcellus R.	Cincinnatus.

10

DELAWARE COUNTY.

Original.	Allaben, Orson M.	Margaretville.
	Morrow, William B.	Walton.
	Smith, George C.	Delhi.
	Travis, Edward M.	Masonville.
Original.	*Young, Oscar H.	Sidney Centre.

5

MADISON COUNTY.

Original.	Birdsall, Gilbert.	N. Brookfield.
	Burhyte, O. W.	Brookfield.
	Cavana, Martin.	Oneida.
Original.	Carpenter, Henry W.	Oneida.
	Drake, Frank C.	Oneida.
Original.	Nicholson, A. R.	Madison.
	Ure, Herman D.	Wampsville.

7

ONONDAGA COUNTY.

Original.	Aberdein, Robert.	Syracuse.
Founder.	Allen, Henry B.	Baldwinsville.
	Brown, Ulysses H.	Syracuse.
	Campbell, A. J.	Syracuse.
Original.	Cook, George W.	Syracuse.
Founder.	Dallas, Alexander J.	Syracuse.
Founder.	Didama, Henry D.	Syracuse.
Original.	Donohue, Florence O.	Syracuse.
	Earle, George W.	Tully.
Founder.	Earll, George W.	Skaneateles.
Original.	Edwards, Amos S.	Syracuse.
Original.	Edwards, George A.	Syracuse.
	*Elder, J. S.	Lysander.
Founder.	Elsner, Henry L.	Syracuse.
	Flanigan, John R.	Syracuse.
	Frazee, A. Blair.	Elbridge.

* Deceased.

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Original. Gillette, Charles A. Syracuse.
Original. Hatch, C. A. Syracuse.
Founder. Head, Adelbert D. Syracuse.
Original. Higgins, Seabury M. Memphis.
Original. Jacobson, Nathan. Syracuse.
Original. Knapp, Edwin A. Jamesville.
Founder. Kneeland, Jonathan. South Onondaga.
Magee, Charles M. Syracuse.
Original. McNamara, Daniel. Syracuse.
Original. Munson, W. W. Otisco.
Founder. Parsons, Israel. Marcellus.
Original. Saxer, Leonard A. Syracuse.
Sears, F. W. Syracuse.
Stephenson, F. Halleck. Syracuse.
Founder. Van de Warker, Ely. Syracuse.
Original. Whitford, James. Onondaga Valley.

32

OTSEGO COUNTY.

Original. Barney, C. S. Milford.
Church, B. A. Oneonta.
Ford, M. L. Oneonta.
Founder. Leaning, John K. Cooperstown.
Original. Martin, John H. Otego.
Original. Merritt, George. Cherry Valley.
Original. Sweet, Joseph J. Unadilla.
Sweet, Joshua J. Unadilla.

8

SCHUYLER COUNTY.

Roper, P. B. Alpine.
Smelzer, Baxter T. Havana.

2

SENECA COUNTY.

Allison, Henry E. Willard.
Bellows, George A. Waterloo.
Blaine, Myron D. Willard.
Founder. Lester, Elias. Seneca Falls.
Original. Rhodes, S. D. Seneca Falls.
Founder. *Schoonmaker, E. J. Magee's Corners.
Seaman, Frank G. Seneca Falls.
Welles, S. R. Waterloo.

8

* Deceased.

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TIOGA COUNTY.

Original.	Ayer, W. L.	Owego.
	Cady, George M.	Nichols.
Original.	Eastman, Robert W.	Owego.

3

TOMPKINS COUNTY.

Founder.	Beers, John E.	Danby.
Founder.	Fitch, William.	Dryden.
	Flickinger, John.	Trumansburg.

3

FOURTH OR WESTERN DISTRICT.

ALLEGHANY COUNTY.

	Cottrell, A. W.	Whitesville.
Original.	Stephenson, James A.	Scio.
Original.	Wakely, Benjamin C.	Angelica.

3

CATTARAUGUS COUNTY.

	Eddy, John L.	Olean.
	Ellsworth, Victor A.	East Otto.
	Lake, Albert D.	Perrysburg.
	Mudge, Selden J.	Olean.
Original.	Tompkins, Orren A.	East Randolph.

5

CHAUTAUQUA COUNTY.

Founder.	Ames, Edward.	Sherman.
	Bemus, William Marvin.	Jamestown.
	Bemus, William P.	Jamestown.
Founder.	Chace, William.	Mayville.
Original.	Darling, Frank B.	Westfield.
Founder.	Dean, Harmon J.	Brocton.
	Rolph, R. T.	Dunkirk.
	Richmond, Nelson G.	Fredonia.
Founder.	Strong, Thomas D.	Westfield.

9

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ERIE COUNTY.

Founder.	Andrews, Judson B. Buffalo.
Original.	Atwood, H. L. Collins Centre.
Original.	Baker, Milan. Buffalo.
Original.	Banta, Rollin L. Buffalo.
Original.	Bartlett, Frederick W. Buffalo.
Original.	Barton, Bernard. Buffalo.
Original.	Boies, Loren F. East Hamburgh.
Original.	Briggs, Albert H. Buffalo.
	Brown, George L. Buffalo.
	Burghardt, Francis Augustus. Buffalo.
Original.	Burwell, George M. Buffalo.
Founder.	Cronyn, John. Buffalo.
Original.	Dagenais, Alphonse. Buffalo.
Original.	Daniels, Clayton M. Buffalo.
	Dayton, C. L. Buffalo.
Original.	Dorland, Elias T. Buffalo.
	Fell, George E. Buffalo.
	Fowler, Joseph. Buffalo.
	Frederick, Carlton C. Buffalo.
	Gould, Cassius W. Buffalo.
	Granger, William D. Buffalo.
	Green, Stephen S. Buffalo.
Original.	Greene, DeWitt C. Buffalo.
Founder.	Greene, Joseph C. Buffalo.
Original.	Greene, Walter D. Buffalo.
Original.	Harrington, D. W. Buffalo.
	Hartwig, Marcell. Buffalo.
	Hayd, Herman E. Buffalo.
	Heath, William H. Buffalo.
Founder.	Hoyer, F. F. Tonawanda
	Hubbell, Alvin A. Buffalo.
	Hunt, H. L. Orchard Park.
	Ingraham, Henry D. Buffalo.
	Jackson, William H. Springville.
Original.	Johnson, Thomas M. Buffalo.
	Lapp, Henry. Clarence.
	Long, Ben. G. Buffalo.
Original.	Lynde, Uri C. Buffalo.
	McPherson, George W. Lancaster.
Original.	Murray, William D. Tonawanda.
	Park, Roswell. Buffalo.
Original.	Pettit, John A. Buffalo.
	Phelps, William C. Buffalo.

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Pohlman, Julius. Buffalo.
Original. Putnam, James W. Buffalo.
Stockton, Charles G. Buffalo.
Strong, Orville C. Colden.
Taber, R. C. Tonawanda.
Thornton, William H. Buffalo.
Founder. Tremaine, William S. Buffalo.
Trull, H. P. Williamsville.
Twohey, John J. Buffalo.
Original. Vaughn, Frank O. Buffalo.
Wheeler, Isaac G. Marilla.
Willoughby, M. Buffalo.
Founder. Wyckoff, Cornelius C. Buffalo.

56

GENESEE COUNTY.

Original. Crane, Frank W. Corfu.
Founder. Jackson, Albert P. Oakfield.
Founder. Sprague, William B. Pavilion.
Founder. Townsend, Morris W. Bergen.
Woodward, C. H. Batavia.

5

LIVINGSTON COUNTY.

Brown, J. P. Tuscarora.
Dodge, Frank B. Mount Morris.
Jones, George H. Fowlerville.
Kneeland, B. T. Dalton.
Original. Menzie, R. J. Caledonia.
Original. Moyer, Frank H. Moscow.

6

MONROE COUNTY.

Original. Backus, Ogden. Rochester.
Briggs, C. M. Fairport.
Original. Briggs, William H. Rochester.
Original. Buckley, Charles. Rochester.
Original. Buckley, James. Rochester.
Original. Burke, John J. A. Rochester.
Original. Dunning, J. D. Webster.
Fenno, Henry M. Rochester.
Goler, George W. Rochester.
Founder. Hovey, B. L. Rochester.

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Jones, S. Case. Rochester.
Maine, Alva P. Webster.
McDougall, William D. Spencerport.
Founder. Moore, Edward M. Rochester.
Original. Moore, Edward M., Jr. Rochester.
Original. Moore, Richard Mott. Rochester.
Nold, John B. Rochester.
Original. O'Hare, Thomas A. Rochester.
Original. Pease, Joseph. Hamlin.
Preston, B. I. Rochester.
Founder. *Reynolds, R. C. Pittsford.
Snook, George. Parma.
Stockschlaeder, P. Rochester.
23

NIAGARA COUNTY.

Original. Clark, Simeon T. Lockport.
Eddy, George P. Lewiston.
Huggins, William Q. Sanborn.
3

ONTARIO COUNTY.

Original. Allen, Duncan S. Seneca.
Original. Allen, James H. Gorham.
Founder. Bentley, Francis R. Cheshire.
Original. *Budd, J. Henry. Geneva.
Cruttenden, Albert G. Clifton Springs.
De Laney, John Pope. Geneva.
Original. Hicks, W. Scott. Bristol.
Founder. Nichols, H. W. Canandaigua.
Founder. Simmons, E. W. Canandaigua.
Founder. Smith, Joseph T. Canandaigua.
Original. Vanderhoof, Frederick D. Phelps.
11

ORLEANS COUNTY.

Original. Bailey, William C. Albion.
Original. Barnum, Eugene E. Waterport.
Founder. Chapman, James. Medina.
Curtis, Daniel. Jeddo.
Original. Taylor, John H. Holley.
Founder. Tompkins, H. C. Knowlesville.
6

* Deceased.

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STEUBEN COUNTY.

	Chittenden, Daniel J.	Addison.
Original.	Dunn, Jeremiah.	Bath.
Original.	Ellison, Metler D.	Canisteo.
	Fowler, Thomas B.	Cohocton.
	Hunter, Nathaniel P.	Jasper.
Original.	Jamison, John S.	Hornellsville.
Original.	Perry, Nathaniel M.	Troupsburgh.
	*Robinson, Joseph W.	Hornellsville.
	Wallace, Edwin E.	Jasper.

9

WAYNE COUNTY.

Founder.	Arnold, J. Newton.	Clyde.
Founder.	Colvin, Darwin.	Clyde.
	Horton, David B.	Red Creek.
Original.	Ingraham, Samuel.	Palmyra.
	Lamont, John C.	Sodus.
Original.	Landon, Newell E.	Newark.
	Nutten, Wilbur F.	Newark.
Original.	Sayers, Alexander.	Marion.
Original.	Sprague, John A.	Williamson.
	Sprague, L. S.	Williamson.
Original.	Young, Augustus A.	Newark.

11

WYOMING COUNTY.

Original.	Ellinwood, A. G.	Attica.
	Lusk, Zera J.	Warsaw.
Original.	Palmer, George M.	Pike.
Original.	Rae, Robert.	Portageville.
	Rudgers, Denton W.	Perry.

5

YATES COUNTY.

	Oliver, William.	Penn Yan.
	Smith, David M.	Penn Yan.

2

* Deceased.

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FIFTH OR SOUTHERN DISTRICT.

DUTCHESS COUNTY.

	Baker, Benjamin N.	Rhinebeck.
Original.	Barnes, Edwin.	Pleasant Plains.
	Barton, Thomas J.	Tivoli.
Original.	Bates, Xyris T.	Poughkeepsie.
Original.	Bayley, Guy Carleton.	Poughkeepsie.
	Bird, J. S.	Hyde Park.
Founder.	Codding, George H.	Amenia.
Founder.	Cramer, William.	Poughkeepsie.
Original.	Fletcher, Charles L.	Wing's Station.
	Howland, George T.	Tivoli.
	Julian, John M.	Moore's Mill.
Founder.	Kittredge, Charles S.	Fishkill-on-Hudson.
Founder.	Leroy, Irving D.	Pleasant Valley.
Founder.	Porteous, James G.	Poughkeepsie.
Founder.	Pultz, Monroe T.	Stanfordville.
Original.	*Sutton, George Samuel.	East Fishkill.
Original.	Van Wyck, Richard C.	Hopewell Junction.
Original.	Young, John.	Fishkill-onHudson.

18

KINGS COUNTY.

Founder.	Baker, George W.	Brooklyn, E. D.
	Bell, A. Nelson.	Brooklyn.
	Benton, Stuart H.	Brooklyn.
	Bierwirth, Julius C.	Brooklyn.
Original.	Brundage, Amos H.	Brooklyn.
Original.	Conway, John Francis.	Brooklyn.
	Creamer, Joseph.	Brooklyn, E. D.
	Creamer, Joseph, Jr.	Brooklyn, E. D.
	Feeley, James F.	Brooklyn, E. D.
	Gardiner, William F.	Brooklyn.
Original.	Ilgen, Ernest.	Brooklyn.
Original.	Jenkins, John A.	Brooklyn, E. D.
	Jewett, F. A.	Brooklyn.
Original.	Leighton, Nathaniel W.	Brooklyn.
	Little, Frank.	Brooklyn.
Original.	Lloyd, T. Mortimer.	Brooklyn.
Original.	Lung, Jesse B.	Brooklyn.
Original.	McCollom, William.	Brooklyn.
Original.	Minard, E. J. Chapin.	Brooklyn.

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Original. North, Nelson L. Brooklyn.
Ostrander, George A. Brooklyn.
Original. Paine, Arthur R. Brooklyn.
Original. Pray, S. R. Brooklyn.
Reed, Henry B. Brooklyn.
Risch, Henry F. Brooklyn.
Rochester, Thomas M. Brooklyn.
Founder. Rushmore, John D. Brooklyn.
Original. Russell, William G. Brooklyn.
Founder. Segur, Avery. Brooklyn.
Original. Shepard, A. Warren. Brooklyn.
Original. Sizer, Nelson Buell de S. Brooklyn.
Founder. Squibb, Edward H. Brooklyn.
Founder. Squibb, Edward R. Brooklyn.
Original. Steinke, Carl Otho Hermann. Brooklyn.
Sullivan, John D. Brooklyn.
Original. Thayer, William Henry. Brooklyn.
Thwing, Clarence. Brooklyn.
Vanderveer, J. R. Brooklyn.
Original. Wieber, George. Brooklyn.
Original. Williams, William H. Brooklyn.
Founder. Wyckoff, Richard M. Brooklyn.

41

NEW YORK COUNTY.

Agramonte, E. V. New York.
Original. Allen, S. Busby. New York.
Allen, Thomas H. New York.
Original. Arcularius, Lewis. New York.
Original. Arnold, Edmund S. F. New York.
Arnold, Glover C. New York.
Baldwin, F. A. New York.
Ballou, William R. New York.
Original. Bathgate, James. Morrisania, New York.
Benedict, Charles S. New York.
Biggs, Chauncey P. New York.
Original. Biggs, Herman M. New York.
Original. Blakeman, William N. New York.
Founder. Bozeman, Nathan. New York.
Bozeman, Nathan G. New York.
Broderick, William P. New York.
Original. Bryant, Joseph D. New York.
Original. Buchanan, Alexander. New York.

* Deceased.

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Original.	Bull, Charles Stedman. New York.
	Bull, William T. New York.
Original.	Burchard, Thomas H. New York.
Founder.	Cameron, Edward M. New York.
Founder.	Carroll, Alfred Ludlow. New York.
Original.	Carter, H. Skelton. New York.
Original.	Chauveau, Jean F. New York.
Original.	Chrystie, T. M. Ludlow. New York.
	Collins, Stacy B. New York.
	Comfort, John E. New York.
Founder.	Conover, William S. New York.
	Conway, John R., Jr. New York.
	Currier, Charles G. New York.
Original.	Curry, Walker. New York.
	Damainville, Lucien. New York.
	Davis, Robert C. New York.
Original.	Denison, C. Ellery. New York.
Original.	Denison, Ellery. New York.
Founder.	Dennis, Frederic S. New York.
Founder.	Detmold, William. New York.
Founder.	Du Bois, Abram. New York.
Original.	Du Bois, Matthew B. New York.
	Dudley, A. Palmer. New York.
	Dunham, Edward K. New York.
Original.	Eliot, Ellsworth. New York.
	Erdmann, John T. New York.
	Farrington, Joseph O. New York.
	Flinn, Thomas W. P. New York.
Founder.	Flint, Austin. New York.
Founder.	Flint, William H. New York.
	Foster, George V. New York.
	Frankenberg, Jacob H. New York.
Original.	Furman, Guido. New York.
Original.	Garrish, John P. New York.
	Gleitsmann, J. W. New York.
	Goldthwaite, Henry. New York.
Founder.	Gouley, John W. S. New York.
	Grauer, Frank. New York.
Original.	Harrison, George Tucker. New York.
Original.	Hills, S. Augden. New York.
Founder.	Hinton, John H. New York.
Founder.	Hodgman, Abbott. New York.
	Holmes, Martha C. New York.
	Hubbard, Dwight L. New York.

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Hubbard, George E. New York.
Hubbard, Oliver P. New York.
Founder. Hubbard, Samuel T. New York.
Founder. Janeway, Edward G. New York.
Janvrin, J. E. New York.
Jenkins, William T. New York.
Kessler, Adolph. New York.
King, Ferdinand. New York.
Kneer, F. G. New York.
Knipe, George. New York.
Founder. Leale, Charles A. New York.
Lewengood, Samuel. New York.
Lewis, Robert. New York.
Lockwood, Charles E. New York.
Lukens, Anna. New York.
Founder. Lusk, William T. New York.
Lynch, Patrick J. New York.
McBurney, Charles. New York.
MacGregor, James R. New York.
McGillicuddy, T. J. New York.
McGowan, John P. New York.
McIlroy, Samuel H. New York.
Founder. McLeod, S. B. Wylie. New York.
Original. McLochlin, James A. New York.
Original. McNamara, Laurence J. New York.
McTammany, George H. New York.
Founder. Manley, Thomas H. New York.
Marshall, Francis F. New York.
Matthews, David. New York.
Maury, Rutson. New York.
Meier, Gottlieb C. H. New York.
Original. Miller, William T. New York.
Milliken, S. E. New York.
Original. Miranda, Ramon L. New York.
Original. Mitchell Hubbard W. New York.
Mott, Valentine. New York.
Original. Murphy, John. New York.
Original. Murray, Sandford J. New York.
Newberry, John S. New York.
Original. Newman, Robert. New York.
Founder. Nicoll, Henry D. New York.
Original. Oberndorfer, Isidor P. New York.
O'Brien, Frederick Wm. New York.
Ochs, Benjamin F. New York.

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Palmer, Edmund J. New York.
Original. Parsons, John. New York.
Perry, John Gardner. New York.
Original. Pooler, Hiram A. New York.
Original. Porter, P. Brynberg. New York.
Founder. Purple, Samuel S. New York.
Ransom, H. B. New York.
Read, Ira B. New York.
Original. Ricketts, Benjamin M. New York.
Rodgers, Harris C. New York.
Roth, Julius A. New York.
Ruggles, Augustus D. New York.
Original. Sabine, Gustavus A. New York.
Sanders, E. New York.
Founder. Sayre, Lewis A. New York.
Founder. *Sayre, Lewis Hall. New York.
Sayre, Reginald H. New York.
Shaw, Henry B. New York.
Shrady, John. New York.
Original. *Skiff, George V. New York.
Small, John W. New York.
Smeallie, James A. New York.
Original. Smith, J. Lewis. New York.
Original. Smith, Samuel W. New York.
Original. Smith, Stephen. New York.
Founder. *Taylor, Isaac E. New York.
Founder. Thomas, T. Gaillard. New York.
Truax, J. G. New York.
Founder. Tucker, Carlos P. New York.
Van Fleet, Frank. New York.
Vincent, Ludger C. New York.
Original. Wallach, Joseph G. New York.
Walsh, Simon J. New York.
Founder. Ward, Charles S. New York.
Warner, John W. New York.
Weston, Albert T. New York.
*White, Francis V. New York.
Founder. White, Whitman V. New York.
Founder. White, William T. New York.
Founder. Wiener, Joseph. New York.
Williamson, Edward A. New York.
Founder. *Wood, Charles S. New York.
Original. Wyeth, John A. New York.

149

* Deceased.

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ORANGE COUNTY.

	Conner, Milton C.	Middletown.
Original.	*Eager, William B.	Middletown.
Original.	Hunt, James H.	Port Jervis.
	Potts, E.	Port Jervis.
	Swartwout, H. B.	Port Jervis.

5

PUTNAM COUNTY.

Founder.	Murdock, George W.	Cold Spring.
Founder.	Young, William.	Cold Spring.

2

QUEENS COUNTY.

Original.	Burns, William J.	Roslyn.
Original.	Rave, Edward G.	Oyster Bay.
Original.	*Webb, Edwin.	Hempstead.

3

RICHMOND COUNTY.

Founder.	Johnston, Francis U.	New Brighton.
	Kinyoun, Joseph J.	Stapleton.
	Martindale, F. E.	Port Richmond.
	Walser, Wm. C.	Port Richmond.

4

ROCKLAND COUNTY.

Founder.	Govan, William.	Stony Point.

1

SUFFOLK COUNTY.

Original.	Banks, George B.	Huntington.
Original.	Chambers, Martin L.	Port Jefferson.
	Hamil, Edward H.	Islip.
	Hulse, William A.	Bay Shore.
Original.	Lindsay, Wallie.	Huntington.
Founder.	Woodend, William D.	Huntington.

6

SULLIVAN COUNTY.

Original.	Bennett, Thomas W.	Jeffersonville.
	Crocker, Edwin.	Narrowsburgh.

* Deceased.

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De Kay, William H. Parksville.
Johnston, N. B. Barryville.
McWilliams, F. A. Monticello.
Original. Munson, J. A. Grahamsville.
6

ULSTER COUNTY.

Original. Chambers, Jacob. Kingston.
Original. HoornBeek, Philip Du Bois. Wawarsing.
Founder. Hühne, August. Rondout.
Original. Hühne Frederick. Rondout.
Keefe, Christopher F. Rondout.
Original. Van Hoevenberg, Henry. Kingston.
Ward, John J. Ellenville.
Original. Ward, Stanley M. Ellenville.
8

WESTCHESTER COUNTY.

Acker, Thomas J. Croton Landing.
*Ashton, Isaiah H. Dobbs Ferry.
Original. Brush, Edward F. Mount Vernon.
Original. Contant, Richard B. Tarrytown.
Dunham, Theodore. Irvington.
Original. Furman, J. Henry. Tarrytown.
Original. Huntington, Henry K. New Rochelle.
Founder. Husted, Nathaniel C. Tarrytown.
Original. Lyons, G. A. New Rochelle.
Original. Schmidt, H. Ernest. White Plains.
Original. Southworth, Richmond Joseph. Yonkers.
Original. Wells, William L. New Rochelle.
12

SUMMARY OF FELLOWSHIP BY DISTRICT.

First District,	96
Second District,	104
Third District,	123
Fourth District,	154
Fifth District,	255
Total Fellowship,	732

* Deceased.

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ALPHABETICAL LIST OF FELLOWS.

Abell, Ira H., Antwerp, Jefferson Co. Founder.
Aberdein, Robert, 2 Greeley Block, Syracuse, Onondaga Co. Original.
Acker, Thomas J., Croton Landing, Westchester Co.
Agramonte, E. V., 435 W. 22d St., New York, New York Co.
Allaben, Orson M., Margaretville, Delaware Co. Original.
Allen, Amos, Grafton, Rensselaer Co. Original.
Allen, Charles S., Greenbush, Rensselaer Co. Founder.
Allen, Duncan S., Seneca, Ontario County. Original.
Allen, Henry B., Baldwinsville, Onondaga Co. Founder.
Allen, James H., Gorham, Ontario Co. Original.
Allen, S. Busby, 145 E. 83d St., New York, New York Co. Original.
Allen, S. P., Whitney's Point, Broome Co.
Allen, Thomas H., 52 W. 45th St., New York, New York Co.
Allen, William L., Greenbush, Rensselaer Co.
Allison, Henry E., Willard, Seneca Co.
Ames, Edward, Sherman, Chautauqua Co. Founder.
Andrews, Judson B., State Hospital, Buffalo, Erie Co. Founder.
Arcularius, Lewis, 121 E. 25th St., New York, New York Co. Original.
Armstrong, James A., Clinton, Oneida Co.
Arnold, Edmund S. F., Hotel Bristol, 504 Fifth Ave., New York, New York Co. Original.
Arnold, Glover C., 115 E. 30th St., New York, New York Co.
Arnold, J. Newton, Clyde, Wayne Co. Founder.
*Ashton, Isaiah H., Dobbs Ferry, Westchester Co.
Atwood, H. L., Collins Centre, Erie Co. Original.
Ayer, W. L., Owego, Tioga Co. Original.
Ayres, Douglas, Fort Plain, Montgomery Co. Original.
Babcock, H. E., New London, Oneida Co. Original.
Babcock, Myron N., Saratoga Springs, Saratoga Co. Founder.
Backus, Ogden, 67 S. Fitzhugh St., Rochester, Monroe Co. Original.
Bacon, Charles G., Fulton, Oswego Co.
Bagg, Moses M., Utica, Oneida Co. Original.
Bailey, Theodore P., 90 Eagle St., Albany, Albany Co. Founder.
Bailey, William C., Albion, Orleans Co. Original.
Baker, Benjamin N., Rhinebeck, Dutchess Co.

* Deceased.

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Baker, George W., 540 Bedford Ave., Brooklyn, E. D., Kings Co. Founder.
Baker, Milan, 471 Niagara St., Buffalo, Erie Co. Original.
Baldwin, F. A., 329 W. 23d St., New York, New York Co.
Ballou, William R., 220 E. 31st St., New York, New York Co.
Banks, George B., Huntington, Suffolk Co. Original.
Banta, Rollin L., 330 Elk St., Buffalo, Erie Co. Original.
Barnes, Edwin, Pleasant Plains, Dutchess Co. Original.
Barney, Charles S., Milford, Otsego Co. Original.
Barnum, D. Albert, Cassville, Oneida Co.
Barnum, Eugene E., Waterport, Orleans Co. Original.
Bartlett, Frederick W., 112 Ellicott St., Buffalo, Erie Co. Original.
Barton, Lyman, Willsborough, Essex Co. Founder.
Barton, Thomas J., Tivoli, Dutchess Co.
Bartow, Bernard, 220 Franklin St., Buffalo, Erie Co.
Bates, Nelson W., Central Square, Oswego Co.
Bates, Xyris T., Poughkeepsie, Dutchess Co. Original.
Bathgate, James, Fordham Ave., Morrisania, New York, New York Co. Original.
Bayley, Guy Carleton, Poughkeepsie, Dutchess Co. Original.
Baynes, William T., 2419 5th Ave., Troy, Rensselaer Co. Original.
Beers, John E., Danby, Tompkins Co. Founder.
Bell, A. Nelson, 113A 2d Place, Brooklyn, Kings Co.
Bellows, George A., Waterloo, Seneca Co.
Bemus, Wm. Marvin, Jamestown, Chautauqua Co.
Bemus, William P., Jamestown, Chautauqua Co.
Benedict, Charles S., 339 W. 19th St., New York, New York Co.
Benham, John C., Hudson, Columbia Co. Original.
Bennett, Thomas W., Jeffersonville, Sullivan Co. Original.
Bentley, Francis R., Cheshire, Ontario Co. Original.
Benton, Stuart H., 1257 Bedford Ave., Brooklyn, Kings Co.
Bierwirth, Julius C., 137 Montague St., Brooklyn, Kings Co.
Biggam, William H., Jr., Fort Plain, Montgomery Co. Original.
Biggs, Chauncey P., 58 E. 25th St., New York, New York Co.
Biggs, Hermann M., 58 E. 25th St., New York, New York Co. Original.
Bird, J. S., Hyde Park, Dutchess Co.
Birdsall, Gilbert N., Brookfield, Madison Co. Original.
Blaine, Myron D., Willard, Seneca Co.
Blair, Louis P., McDonough, Chenango Co. Original.
Blake, Clarence R., Northville, Fulton Co. Original.
Blakeman, William N., 28 W. 37th St., New York, New York Co. Original.
Blumer, G. Alder, State Hospital, Utica, Oneida Co. Original.
Boies, Loren F., East Hamburgh, Erie Co. Original.

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Bond, G. F. M., State Hospital, Utica, Oneida Co.
Bonesteel, William N., Mill St., Troy, Rensselaer Co. Founder.
Bontecou, Reed B., 82 4th St., Troy, Rensselaer Co. Original.
Booth, Wilbur H., 172 Genesee St., Utica, Oneida Co. Original.
Bozeman, Nathan, 9 W. 31st St., New York, New York Co. Founder.
Bozeman, Nathan G., 9 W. 31st St., New York, New York Co.
Bradford, George D., Homer, Cortland Co.
Briggs, Albert H., 267 Hudson St., Buffalo, Erie Co. Original.
Briggs, C. M., Fairport, Monroe Co.
Briggs, William H., 138 E. Main St., Rochester, Monroe Co. Original.
Brodrick, William P., 166 W. 121st St., New York, New York Co.
Brooks, Leroy J., Norwich, Chenango Co. Original.
Brown, Charles W., 312 W. Church St., Elmira, Chemung Co. Original.
Brown, George L., 173 Niagara St., Buffalo, Erie Co.
Brown, J. P., Tuscarora, Livingston Co.
Brown, Ulysses H., 312 Warren St., Syracuse, Onondaga Co.
Brundage, Amos H., 609 Madison St., Brooklyn, Kings Co. Original.
Brush, Edward F., Mount Vernon, Westchester Co. Original.
Brush, Edward N., Penn. Hosp. for the Insane, Philadelphia, Penn. Original.
Bryant, Joseph D., 54 W. 36th St., New York, New York Co. Original.
Buchanan, Alexander, 63 W. 36th St., New York, New York Co. Original.
Buckley, Charles, 127 E. Main St., Rochester, Monroe Co. Original.
Buckley, James, 127 E. Main St., Rochester, Monroe Co. Original.
*Bucklin, Daniel D., 575 2d Ave., Lansingburgh, Rensselaer Co. Original.
*Budd, J. Henry, Geneva, Ontario Co. Original.
Bull, Charles Stedman, 47 W. 36th St., New York, New York Co. Original.
Bull, William T., 35 W. 35th St., New York, New York Co.
Burbeck, Charles H., 91 1st St., Troy, Rensselaer Co. Founder.
Burchard, Thomas H., 24 W. 40th St., New York, New York Co. Original.
Burghardt, Francis Augustus, 632 Elm St., Buffalo, Erie Co.
Burhyte, O. W., Brookfield, Madison Co.
Burke, John J. A., 65 East Ave., Rochester, Monroe Co. Original.
Burns, William J., Roslyn, Queens Co. Original.
Burton, Matthew H., 75 4th St., Troy, Rensselaer Co. Founder.
Burwell, George N., 130 Pearl St., Buffalo, Erie Co. Original.
Cady, George M., Nichols, Tioga Co.
Cameron, Edward M., 22 W. 47th St., New York, New York Co. Founder.
Campbell, A. J., 332 Warren St., Syracuse, Onondaga Co.

* Deceased.

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Carpenter, Henry W., Oneida, Madison Co. Original.
Carroll, Alfred Ludlow, 30 W. 59th St., New York, New York Co. Founder.
Carter, H. Skelton, 130 E. 24th St., New York, New York Co. Original.
*Case, M. W., 39 2d St., Troy, Rensselaer Co.
Casey, J. E., Mohawk, Herkimer Co.
Cavana, Martin, Oneida, Madison Co.
Chace, William, Mayville, Chautauqua Co. Founder.
Chambers, Jacob, Kingston, Ulster Co. Original.
Chambers, Martin L., Port Jefferson, Suffolk Co. Original.
Chapman, James, Medina, Orleans Co. Founder.
Chauveau, Jean F., 31 W. 60th St., New York, New York Co. Original.
Chittenden, Daniel J., Addison, Steuben Co.
Chittenden, Joseph H. Binghamton, Broome Co. Founder.
Chrystie, T. M. Ludlow, 216 W. 46th St., New York, New York Co. Original.
Church, B. A., Oneonta, Otsego Co.
Church, Charles A., Bloomingdale, Essex Co.
Churchill, Alonzo, 189 Genesee St., Utica, Oneida Co.
Clark, Dewitt C., Marathon, Cortland Co. Original.
Clark, Simeon Tucker, Lockport, Niagara Co. Original.
Clarke, Wallace. 136 Park Ave., Utica, Oneida, Co.
Codding, George H., Amenia, Dutchess Co. Founder.
Collins, Stacy B., 106 E. 35th St., New York, New York Co.
Colvin, Darwin, Clyde, Wayne Co. Founder.
Comfort, John E., 1315 Franklin Ave., New York, New York Co.
Comstock, George F., Saratoga Springs, Saratoga Co. Founder.
Conkling, George, Durham, Greene Co. Original.
Connor, Milton C., Middletown, Orange Co.
Conover, William S., 203 W. 135th St., New York, New York Co. Founder.
Conway, John Francis, 880 Bedford Ave., Brooklyn, Kings Co. Original.
Conway, John R., Jr., 14 Lexington Ave., New York, New York Co.
Cook, George W., Syracuse, Onondaga Co. Original.
Cook, Guy Reuben, Louisville, St. Lawrence Co.
Cooley, R. N., Hannibal Centre, Oswego Co.
Cooper, William C., 81 3d St., Troy, Rensselaer Co. Original.
Cooper, William S., 81 3d St., Troy, Rensselaer Co. Founder.
Copley, Herman D., Bainbridge, Chenango Co.
Cottrell, A. W., Myerstown, Lebanon Co., Pa.
Coutant, Richard B., Tarrytown, Westchester Co. Original.
Cramer, William, 136 Mansion St., Poughkeepsie, Dutchess Co. Founder.
Crane, Frank W., Corfu, Genesee Co. Original.
Crawe, J. Mortimer, Watertown, Jefferson Co. Founder.

* Deceased.

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Creal, Charles E., 2443 McCoy Ave., Kansas City, Mo. Founder.
Creamer, Joseph, 154 Hewes St., Brooklyn, E. D., Kings Co.
Creamer, Joseph, Jr., 168 N. 6th St., Brooklyn, E. D., Kings Co.
Crim, Frank D., Lincoln, Nebraska.
Crocker, Edwin, Narrowsburgh, Sullivan Co.
Crombie, Walter C., Schaghticoke, Rensselaer Co. Original.
Cronyn, John, 55 W. Swan St., Buffalo, Erie Co. Founder.
Crosby, Alexander H., Lowville, Lewis Co.
Cruttenden, Albert G., Clifton Springs, Ontario Co.
Currier, Charles G., 75 W. 55th St., New York, New York Co.
Curry, Walker, 21 E. 61st St., New York, New York Co. Original.
Curtis, Daniel, Jeddo, Orleans Co.
Curtis, P. C., Round Lake, Saratoga Co.
Dagenais, Alphonse, 348 E. Eagle St., Buffalo, Erie Co. Original.
Dallas, Alexander J., 48 Warren St., Syracuse, Onondaga Co. Founder.
Damainville, Lucien, 251 W. 84th St., New York, New York Co.
Daniels, Clayton M., 82 N. Pearl St., Buffalo, Erie Co. Original.
Darling, Frank B., Westfield, Chautauqua Co. Original.
D'Avignon, Francis J., Au Sable Forks, Essex Co. Original.
Davis, Robert C., 150 E. 128th St., New York, New York Co.
Dayton, C. L., 246 Dearborn St., Buffalo, Erie Co.
Dean, Harmon J., Brocton, Chautauqua Co. Founder.
De Kay, William H., Parksville, Sullivan Co.
De Laney, John Pope, Geneva, Ontario Co.
Denison, Charles Ellery, 124 W. 13th St., New York, New York Co. Original.
Denison, Ellery, 124 W. 13th St., New York, New York Co. Original.
Dennis, Frederic S., 542 Madison Ave., New York, New York Co. Founder.
Detmold, William, 38 E. 9th St., New York, New York Co. Founder.
De Witt, Byron, Oswego, Oswego Co. Original.
de Zouche, Isaac, Gloversville, Fulton Co. Founder.
Didama, Emory A., Cortland, Cortland Co.
Didama, Henry D., 112 S. Salina St., Syracuse, Onondaga Co. Founder.
Dodge, Amos P., Oneida Castle, Oneida Co.
Dodge, Frank B., Mount Morris, Livingston Co.
Dodge, Lyndhurst C., Rouse's Point, Clinton Co. Founder.
Donohue, Florence O., 54 S. Clinton St., Syracuse, Onondaga Co. Original.
Dorland, Elias T., 86 N. Division St., Buffalo, Erie Co. Original.
Douglas, George, Oxford, Chenango Co.
Douglass, A. J., Ilion, Herkimer Co.
Douglass, Charles E., Constableville, Lewis Co.
Douglass, James W., Booneville, Oneida Co.

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Dowd, Pascal M., Oswego, Oswego Co.
Drake, D. Delos, Johnstown, Fulton Co.
Drake, Frank C., Oneida, Madison Co.
Du Bois, Abram, 16 W. 30th St., New York, New York Co. Founder.
Du Bois, Matthew B., 41 W. 33d St., New York, New York Co. Original.
Dudley, A. Palmer, 640 Madison Ave., New York, New York Co.
Dunham, Edward K., 53 E. 30th St., New York, New York Co.
Dunham, Theodore, Irvington, Westchester Co.
Dunlop, John J., Waterford, Saratoga Co. Original.
Dunn, Jeremiah, Bath, Steuben Co. Original.
Dunning, J. D., Webster, Monroe Co. Original.
*Eager, William B., Middletown, Orange Co. Original.
Earle, George W., Tully, Onandaga Co.
Earll, George W., Skaneateles, Onondaga Co. Founder.
Eastman, Robert W., Owego, Tioga Co. Original.
Eddy, George P., Lewiston, Niagara Co.
Eddy, John L., Olean, Cattaraugus Co.
*Edgerly, Edward F., Moriah Centre, Essex Co. Founder.
Edwards, Amos S., 367 N. Salina St., Syracuse, Onondaga Co. Original.
Edwards, George A., Catherine and Lodi Sts., Syracuse, Onondaga Co. Original.
Edwards, John, Gloversville, Fulton Co.
*Elder, J. Stevens, 2613 Nicollet Ave., Minneapolis, Minn.
Eliot, Ellsworth, 48 W. 46th St., New York, New York Co. Original.
Ellinwood, A. G., Attica, Wyoming Co. Original.
Ellis, J. B., Little Falls, Herkimer Co.
Ellison, Metler D., Canisteo, Steuben Co. Original.
Ellsworth, Victor A., East Otto, Cattaraugus Co.
Elsner, Henry L., 308 N. Salina St., Syracuse, Onondaga Co. Founder.
Ely, Henry Oliver, Binghamton, Broome Co. Original.
English, G. P., Booneville, Oneida Co.
Ennis, Alexander, Pattersonville, Schenectady Co.
Erdmann, John T., 130 E. 27th St., New York, New York Co.
Farnham, LeRoy D., Binghamton, Broome Co.
Farrington, John M., Binghamton, Broome Co.
Farrington, Joseph O., 1991 Madison Ave., New York, New York Co.
Feely, James F., 296 Lorimer St., Brooklyn, E. D., Kings Co.
Fell, George E., 72 Niagara St., Buffalo, Erie Co.
Fenno, Henry Marshall, 77 W. Main St., Rochester, Monroe Co.
Ferguson, E. D., 1 Union Place, Troy, Rensselaer Co. Founder.
Ferguson, James, Glens Falls, Warren Co. Original.
Finder, William, Jr., 2 Union Place, Troy, Rensselaer Co. Founder.
Fitch, William, Dryden, Tompkins Co. Founder.

* Deceased.

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Fitzgerald, David J., Glens Falls, Warren Co.
Flandrau, Thomas M., Rome, Oneida Co.
Flanigan, John R., Syracuse, Onondaga Co.
Fletcher, Charles L., Wing's Station, Dutchess Co. Original.
Flickinger, John, Trumansburg, Tompkins Co.
Flinn, Thomas W. P., 137 E. 28th St., New York, New York Co.
Flint, Austin, 14 W. 33d St., New York, New York Co. Founder.
Flint, William H., 37 E. 33d St., New York, New York Co. Founder.
Ford, M. L., Oneonta, Otsego Co.
Foster, George V., 109 E. 18th St., New York, New York Co.
Fowler, Joseph, 31 Church St., Buffalo, Erie Co.
Fowler, Thomas B., Cohocton, Steuben Co.
Fox, Eli, Mohawk, Herkimer Co.
Frankenberg, Jacob H., 142 E. 74th St., New York, New York Co.
Fraser, Jefferson C., Ava, Oneida Co.
Frazee, A. Blair, Elbridge, Onondaga Co.
Frederick, Carlton C., 64 Richmond Ave., Buffalo, Erie Co.
French, S. H., Amsterdam, Montgomery Co.
Fritts, Crawford Ellsworth, Hudson, Columbia Co.
Fuller, Earl D., 66 Varick St., Utica, Oneida Co.
Fuller, Robert, Schenectady, Schenectady Co.
Furman, Guido, 125 W. 73d St., New York, New York Co. Original.
Furman, J. Henry, Tarrytown, Westchester Co. Original.
Gardiner, W. F., 162 6th Ave., Brooklyn, Kings Co.
Garlock, William D., Little Falls, Herkimer Co.
Garrish, John P., 2147 7th Ave., New York, New York Co. Original.
Getty, A. H., Athens, Greene Co.
Gibson, William M., 187 Genesee St., Utica, Oneida Co.
Gillette, Charles A., S. Salina and Castle Sts., Syracuse, Onondaga Co. Original.
Gillis, William, Fort Covington, Franklin Co. Founder.
Glass, James H., 170 Genesee St., Utica, Oneida Co.
Gleitsmann, J. W., 117 2d Ave., New York, New York Co.
Glidden, Charles H., Little Falls, Herkimer Co. Original.
Goldthwaite, Henry, Fifth Avenue Hotel, New York, New York Co.
Goler, George W., 54 S. Fitzhugh St., Rochester, Monroe Co.
Gould, Cassius W., 1428 Main St., Buffalo, Erie Co.
Gouley, John W. S., 324 Madison Ave., New York, New York Co. Founder.
Govan, William, Stony Point, Rockland Co. Founder.
Gow, Frank F., Schuylerville, Saratoga Co.
Granger, William D., State Hospital, Buffalo, Erie Co.
Grant, Charles S., Saratoga Springs, Saratoga Co. Founder.
Grauer, Frank, 326 W. 46th St., New York, New York Co.

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Graves, Ezra, Amsterdam, Montgomery Co. Original.
Gray, John P., Utica, Oneida Co.
Green, Caleb, Homer, Cortland Co. Founder.
Green, H. H., Paine's Hollow, Herkimer Co.
Green, Stephen S., 384 Swan St., Buffalo, Erie Co.
Greene, Clark W., Chenango Forks, Broome Co.
Greene, De Witt C., 124 E Swan St., Buffalo, Erie Co. Original.
Greene, Joseph C., 124 E. Swan St., Buffalo, Erie Co. Founder.
Greene, Walter D., 444 Elk St., Buffalo, Erie Co. Original.
Greenman, C. E., 575 1st St., Troy, Rensselaer Co.
Guy, J. D., Coventry, Chenango Co.
Hagadorn, William, Gilboa, Schoharie Co. Original.
Halbert, M. L., Cincinnatus, Cortland Co.
Hall, William A., Minneapolis, Minn. Original.
Hall, William H., Saratoga Springs, Saratoga Co. Original.
Hamill, Edward H., Newark, New Jersey.
Hammer, Charles, Schenectady, Schenectady Co.
Hand, S. M., Norwich, Chenango Co.
Hannan, James C., Hoosick Falls, Rensselaer Co. Founder.
Harrington, D. W., 1430 Main St., Buffalo, Erie Co. Original.
Harrison, George Tucker, 221 W. 23d St., New York, New York Co. Original.
Hartwig, Marcell, 38 E. Huron St., Buffalo, Erie Co.
Harvie, J. B., 6 Clinton Place, Troy, Rensselaer Co. Founder.
Hatch, C. A., 6 E. Onondaga St., Syracuse, Onondaga Co. Original.
Hayd, Herman E., 78 Niagara St., Buffalo, Erie Co.
Hayes, Philetus A., Afton, Chenango Co.
Head, Adelbert D., Syracuse, Onondaga Co. Founder.
Heath, William H., 415 Pearl St., Buffalo, Erie Co.
Heimstreet, Thomas B., 14 Division St., Troy, Rensselaer Co. Original.
Hendrick, Henry C., McGrawville, Cortland Co. Founder.
Hicks, W. Scott, Bristol, Ontario Co. Original.
Higgins, F. W., Cortland, Cortland Co.
Higgins, Seabury M., Memphis, Onondaga Co. Original.
Hills, Lyman H., Binghamton, Broome Co. Original.
Hills, Samuel Augden, 53 E. 123d St., New York, New York Co. Original.
Hinton, John H., 41 W. 32d St., New York, New York Co. Founder.
Hodgman, Abbott, 141 E. 38th St., New York, New York Co. Founder.
Hodgman, William H., 109 Caroline St., Saratoga Springs, Saratoga Co. Founder.
Holden, Arthur L., 116 South St., Utica, Oneida Co.
Holmes, Martha C., 13 W. 125th St., New York, New York Co.
HoornBeek, Philip Du Bois, Wawarsing, Ulster Co. Original.
Horton, David B., Red Creek, Wayne Co.

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Hough, F. P., Binghamton, Broome Co.
Houston, David W., 36 Mohawk St., Cohoes, Albany Co. Original.
Hovey, B. L., 34 N. Fitzhugh St., Rochester, Monroe Co. Founder.
Howe, Edwin S., Au Sable Forks, Essex Co. Original.
Howland, George T., Tivoli, Dutchess Co.
Hoyer, F. F., Tonawanda, Erie Co. Founder.
Hubbard, Dwight L., 344 W. 33d St., New York, New York Co.
Hubbard, George E., 257 W. 52d St., New York, New York Co.
Hubbard, Oliver P., 65 W. 19th St., New York, New York Co.
Hubbard, Samuel T., 27 W. 9th St., New York, New York Co. Founder.
Hubbell, Alvin A., 212 Franklin St., Buffalo, Erie Co.
Hudson, George, Stillwater, Saratoga Co.
Huestis, W. B., Kiskatom, Greene Co.
Huggins, William Q., Sanborn, Niagara Co.
Hughes, Henry R., Clinton, Oneida Co.
Hühne, August, Rondout, Ulster Co. Founder.
Hühne, Frederick, Rondout, Ulster Co. Original.
Hulse, William A., Bay Shore, Suffolk Co.
Hunt, H. L., Orchard Park, Erie Co.
Hunt, James G., 5 Gardner Block, Utica, Oneida Co. Original.
Hunt, James H., Port Jervis, Orange Co. Original.
Hunter, Nathaniel P., Jasper, Steuben Co.
Huntington, Henry K., New Rochelle, Westchester Co. Original.
Huntington, John W., Mexico, Oswego Co.
Husted, Nathaniel C., Tarrytown, Westchester Co. Founder.
Ilgen, Ernest, 369 Herkimer St., Brooklyn, Kings Co. Original.
Ingraham, Henry D., 405 Franklin St., Buffalo, Erie Co.
Ingraham, Samuel, Palmyra, Wayne Co. Original.
Inlay, Irwin G., Conklingville, Saratoga Co.
Jackson, Albert P., Oakfield, Genesee Co. Founder.
Jackson, William H., Springville, Erie Co.
Jacobson, Nathan, 114 S. Salina St., Syracuse Onondaga Co. Original.
Jamison, John S., Hornellsville, Steuben Co. Original.
Janeway, Edward G., 36 W. 40th St., New York, New York Co. Founder.
Janvrin, J. E., 191 Madison Ave., New York, New York Co.
Jenkins, John A., 150 Milton St., Brooklyn, E. D., Kings Co. Original.
Jenkins, William T., 113 E. 26th St., New York, New York Co.
Jewett, F. A., 370 Tompkins Ave., Brooklyn, E. D., Kings Co.
Jewett, Homer O., Cortland, Cortland Co. Founder.
Johnson, Charles M., San Diego, Cal. Founder.
Johnson, George P., Mexico, Oswego Co.
Johnson, Ianthus G., Greenfield Centre, Saratoga Co. Original.
Johnson, Leonard M., Greene, Chenango Co. Original.

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Johnson, Parley H., Adams, Jefferson Co. Original.
Johnson, Richard G., Amsterdam, Montgomery Co. Original.
Johnson, Thomas M., 309 Main St., Buffalo, Erie Co. Original.
Johnston, Francis U., New Brighton, Richmond Co. Founder.
Johnston, N. B., Barryville, Sullivan Co.
Jones, George H., Fowlerville, Livingston Co.
Jones, S. Case, 34 N. Fitzhugh St., Rochester, Monroe Co.
Joslin, Albert A., Martinsburgh, Lewis Co.
Julian, John M., Moore's Mill, Dutchess Co.
Keefe, Christopher F., Rondout, Ulster Co.
Keefer, Charles W., Mechanicsville, Saratoga Co.
Keith, Halbert Lyon, Upton; Mass.
Kelly, John Devin, Lowville, Lewis Co.
Kenyon, Benjamin, Cincinnatus, Cortland Co.
Kenyon, M., Moravia, Cayuga Co. Original.
Kessler, Adolph, 644 Lexington Ave., New York, New York Co.
Kilborn, Henry F., Croghan, Lewis Co.
King, Ferdinand, 21 Platt St., New York, New York Co.
Kingsley, Henry F., Schoharie, Schoharie Co. Original.
Kinyoun, Joseph J., Stapleton, Richmond Co.
Kittredge, Charles S., Fishkill-on-Hudson, Dutchess Co. Founder.
Klock, Charles M., St. Johnsville, Montgomery Co.
Knapp, Edwin A., 629 Montgomery St., Syracuse, Onondaga Co. Original
Knapp, W. H., Union Centre, Broome Co.
Kneeland, B. T., Dalton, Livingston Co.
Kneeland, Jonathan S., Onondaga, Onondaga Co. Founder.
Kneer, F. G., 235 W. 51st St., New York, New York Co.
Knipe, George, 354 W. 24th St., New York, New York Co.
Kniskern, A. C., Mechanicsville, Saratoga Co.
Kuhn, William, Rome, Oneida Co.
La Bell, Martin J., Lewis, Essex Co. Original.
Laird, William R., 98 Wall St., Auburn, Cayuga Co. Original.
Lake, Albert D., Perrysburg, Cattaraugus Co.
Lambert, John, Salem, Washington Co.
Lamont, John C., Sodus, Wayne Co.
Landon, Newell E., Newark, Wayne Co. Original.
Lapp, Henry, Clarence, Erie Co.
Leach, H. M., Glen, Montgomery Co. Original.
Leale, Charles A., 604 Madison Ave., New York, New York Co. Founder.
Leaning, John K., Cooperstown, Otsego Co. Founder.
Leighton, N. W., 143 Taylor St., Brooklyn, E. D., Kings Co. Original.
Le Roy, Irving D., Pleasant Valley, Dutchess Co. Founder.
Lester, Elias, Seneca Falls, Seneca Co. Founder.

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*Lester, Sullivan W., 381 1st St., Troy, Rensselaer Co. Original.
Lewengood, Samuel, 129 E. 84th St., New York, New York Co.
Lewis, Robert, 449 E. 118th St., New York, New York Co.
Lindsay, Wallie, Huntington, Suffolk Co. Original.
Little, Frank, 135 Remson St., Brooklyn, Kings Co.
Lloyd, T. Mortimer, 125 Pierrepont St., Brooklyn, Kings Co. Original.
Lockwood, Charles E., 63 W. 36th St., New York, New York Co.
Lockwood, J. W., Philmont, Columbia Co. Original.
Long, Alfred J., Whitehall, Washington Co.
Long, Ben G., 1430 Main St., Buffalo, Erie Co.
Lukens, Anna, 1068 Lexington Ave., New York, New York Co.
Lung, Jesse B., 382 Marion St., Brooklyn, Kings Co. Original.
Lusk, William T., 47 E. 34th St., New York, New York Co. Founder.
Lusk, Zera J., Warsaw, Wyoming Co.
Lyman, Elijah S., Sherburne, Chenango Co. Original.
Lyman, H. C., Sherburne, Chenango Co. Original.
Lynch, Patrick J., 216 E. 13th St., New York, New York Co.
Lynde, Uri C., 13 Niagara St., Buffalo, Erie Co. Original.
Lyon, E. M., Plattsburgh, Clinton Co. Founder.
Lyon, George E., 1915 5th Ave., Troy, Rensselaer Co. Original.
Lyons, G. A., New Rochelle, Westchester Co. Original.
MacGregor, James R., 1037 Madison Ave., New York, New York Co.
Magee, Charles M., 201 Seymour St., Syracuse, Onondaga Co.
Magee, Daniel, 116 3d St., Troy, Rensselaer Co. Original.
Maine, Alvah P., Webster, Monroe Co.
Manley, Thomas H., 302 W. 53d St., New York, New York Co. Founder.
Marsh, E. Frank, Fulton, Oswego Co.
Marsh, James P., 57 Fourth St., Troy, Rensselaer Co.
Marshall, Francis F., 56 W. 56th St., New York, New York Co.
Martin, John H., Otego, Otsego Co. Original.
Martindale, F. E., Port Richmond, Richmond Co.
Martine, Godfrey R., Glens Falls, Warren Co. Original.
Matthews, David, 73 E. 54th St., New York, New York Co.
Maury, Rutson, 252 Madison Ave., New York, New York Co.
McBurney, Charles, 40 W. 36th St., New York, New York Co.
McCollom, William, 195 Lefferts Place, Brooklyn, Kings Co. Original.
McDonald, George E., Schenectady, Schenectady Co. Original.
McDougall, William D., Spencerport, Monroe Co. (San José, Cal.)
McEwen, Robert C., Saratoga Springs, Saratoga Co. Founder.
McFarland, S. F., Binghamton, Broome Co.
McGann, Thomas, Wells, Hamilton Co.
McGillicuddy, T. J., 125 E. 83d St., New York, New York Co.
McGowen, John P., 137 E. 28th St., New York, New York Co.

* Deceased.

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McIlroy, Samuel H., 330 Alexander Ave., New York, New York Co.
McLeod, S. B. Wylie, 247 W. 23d St., New York, New York Co. Founder.
McLochlin, James A., 401 E. 10th St., New York, New York Co. Original.
McNamara, Daniel, 58 W. Genesee St., Syracuse, Onondaga Co. Original.
McNamara, Laurence J., 126 Washington Place (West), New York, New York Co. Original.
McPherson, George W., Lancaster, Erie Co.
McTammany, George H., 454 W. 24th St., New York, New York Co.
McWilliams, F. A., Monticello, Sullivan Co.
Meacham, Isaac D., Binghamton, Broome Co.
Meier, Gotlieb C. H., 210 E. 53d St., New York, New York Co.
Menzie, R. J., Caledonia, Livingston Co. Original.
Merritt, George, Cherry Valley, Otsego Co. Original.
Miller, J. H., Centro, Los Angeles Co., Cal.
Miller, William T., 310 W. 27th St., New York, New York Co. Original.
Milliken, S. E., 131 E. 39th St., New York, New York Co.
Minard, E. J. Chapin, 243 Quincy St., Brooklyn, Kings Co. Original.
Miranda, Ramon L., 54 W. 37th St., New York, New York Co. Original.
Mitchell, Howard E., 84 4th St., Troy, Rensselaer Co. Founder.
Mitchell, Hubbard W., 747 Madison Ave., New York, New York Co. Original.
Moore, Edward M., 74 S. Fitzhugh St., Rochester, Monroe Co. Founder.
Moore, Edward M., Jr., 74 S. Fitzhugh St., Rochester, Monroe Co. Original.
Moore, Richard Mott, 74 S. Fitzhugh St., Rochester, Monroe Co. Original.
Moore, William A., Binghamton, Broome Co.
Moriarta, D. C., Saratoga Springs, Saratoga Co.
*Morrell, Isaac, 218 Madison Ave., Elmira, Chemung Co.
Morrow, William B., Walton, Delaware Co.
Mott, Valentine, 29 E. 24th St., New York, New York Co.
Moyer, Frank H., Moscow, Livingston Co. Original.
Mudge, Selden J., Olean, Cattaraugus Co.
Munger, Charles, Knoxborough, Oneida Co.
Munson, J. A., Woodbourne, Sullivan Co. Original.
Munson, W. W., Otisco, Onondaga Co. Original.
Murdock, George W., Cold Spring, Putnam Co. Founder.
Murphy, John, 219 E. 37th St., New York, New York Co. Original.
Murray, Byron J., Saratoga Springs, Saratoga Co. Original.
Murray, S. J., 133 W. 87th St., New York, New York Co. Original.
Murray, William D., Tonawanda, Erie Co. Original.
Nelson, George W., Orwell, Oswego Co.
Nelson, William H., Taberg, Oneida Co.
Newberry, John S., Columbia College, New York, New York Co.

* Deceased.

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Newman, Robert, 68 W. 36th St., New York, New York Co. Original.
Nichols, Calvin E., Troy, Rensselaer Co. Founder.
Nichols, H. W., Canandaigua, Ontario Co. Founder.
Nichols, William H., West Sand Lake, Rensselaer Co. Founder.
Nicholson, A. R., Madison, Madison Co. Original.
Nicoll, Henry D., 51 E. 57th St., New York, New York Co. Founder.
Nold, John B., 165 North Ave., Rochester, Monroe Co.
North, Nelson L., 509 Bedford Ave., Brooklyn, Kings Co. Original.
Nutten, Wilbur F., Newark, Wayne Co.
Oberndorfer, Isidor P., 160 E. 63d St., New York, New York Co. Original.
O'Brien, Frederick Wm., 234 E. 112th St., New York, New York Co.
Ochs, Benjamin F., 773 Lexington Ave., New York, New York Co.
O'Hare, Thomas A., 157 State St., Rochester, Monroe Co. Original.
Oliver, William, Penn Yan, Yates Co.
Orton, John G., Binghamton, Broome Co. Founder.
Ostrander, George A., 61 Greene Ave., Brooklyn, Kings Co.
Packer, Thurston G., Smyrna., Chenango Co.
Paine, Arthur R., 99 Lafayette Ave., Brooklyn, Kings Co. Original.
Palmer, Edmund J., 1342 Lexington Ave., New York, New York Co.
Palmer, F. A., Mechanicsville, Saratoga Co.
Palmer, George M., Pike, Wyoming Co. Original.
Palmer, Henry C., cor. Genesee and Hopper Sts., Utica, Oneida Co.
Palmer, Walter B., 80 South St., Utica, Oneida Co.
Park, Roswell, 305 Delaware Ave., Buffalo, Erie Co.
Parr, John, Buel, Montgomery Co.
Parsons, Israel, Marcellus, Onondaga Co. Founder.
Parsons, John, Bailey Ave., near Kingsbridge Road, New York, New York Co. Original.
Parsons, W. W. D., Fultonville, Montgomery Co.
Pease, Joseph, Hamlin, Monroe Co.
Perry, John Gardner, 48 E. 34th St., New York, New York Co.
Perry, Nathaniel M., Troupsburgh, Steuben Co. Original.
Peters, Samuel, 86 Mohawk St., Cohoes, Albany Co. Founder.
Pettit, John A., 526 S. Division St., Buffalo, Erie Co. Original.
Phelps, George G., 239 Blandina St., Utica, Oneida Co.
Phelps, William C., 146 Allen St., Buffalo, Erie Co.
Pierce, Edward A., Binghamton, Broome Co.
Pierson, George E., Kirkwood, Broome Co.
Pilgrim, Charles W., State Hospital, Utica, Oneida Co. Original.
Pohlman, Julius, Library Building, Buffalo, Erie Co.
Pollard, Abiathar, Westport, Essex Co. Original.
Pooler, Hiram A., 34 Gramercy Park, New York, New York Co. Original.

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Porteus, James G., Poughkeepsie, Dutchess Co. Founder.
Porter, Harry N., 1910 Harewood Ave., Washington, D. C. Founder.
Porter, P. Brynberg, 8 W. 35th St., New York, New York Co. Original.
Potter, Vaughn C., Starkville, Herkimer Co. Original.
Potts, E., Port Jervis, Orange Co.
Pray, S. R., 65 Morton St., Brooklyn, Kings Co. Original.
Preston, John R., Schuylerville, Saratoga Co. Original.
Preston, B. I., 31 Chestnut St., Rochester, Monroe Co.
Price, John H., 523 Union St., Elmira, Chemung Co. Original.
Pultz, Monroe T., Stanfordville, Dutchess Co. Founder.
Purple, Samuel S., 36 W. 22d St., New York, New York Co. Founder.
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Ransom, H. B., 9 W. 28th St., New York, New York Co. (Burlington, Iowa.)
Rave, Edward G., Hicksville, Queens Co. Original.
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Reed, Harvey B., 12 Vernon Pl., Brooklyn, Kings Co.
Reid, Christopher C., Rome, Oneida Co.
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*Robinson, Joseph W., Hornellsville, Steuben Co.
Rochester, Thomas M., 2 St. James Place, Brooklyn, Kings Co.
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Roper, P. B., Alpine, Schuyler Co.

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Roth, Julius A., 308 E. 79th St., New York, New York Co.
Rousseau, Zotique, 99 2d St., Troy, Rensselaer Co. Founder.
Rudgers, Denton W., Perry, Wyoming Co.
Ruggles, Augustus D., 25 E. 16th St., New York, New York Co.
Rulison, Elbert T., Amsterdam, Montgomery Co. Original.
Rushmore, John D., 129 Montague St., Brooklyn, Kings Co. Founder.
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Russell, William G., 63 Lee Ave., Brooklyn, E. D., Kings Co. Original.
Sabin, William B., 1425 Broadway, West Troy, Albany Co. Founder.
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*Sayre, Lewis Hall, 285 Fifth Ave., New York, New York Co. Founder.
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Sears, F. W., 326 Montgomery St., Syracuse, Onondaga Co.
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Selden, O. G., Catskill, Greene Co. Original.
Selden, Robert, Catskill, Greene Co. Original.
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Sherer, John D., Waterford, Saratoga Co. Original.
Sherman, F. J., Ballston, Saratoga Co.
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Simmons, E. W., Canandaigua, Ontario Co. Founder.
Simons, Frank E., Canajoharie, Montgomery Co.
Sizer, Nelson Buell de S., 336 Greene Ave., Brooklyn, Kings Co. Original.
*Skiff, George V., 313 W. 54th St., New York, New York Co. Original.
Skinner, Smith A., Hoosick Falls, Rensselaer Co. Original.
Small, John W., 153 E. 50th St., New York, New York Co.
Smeallie, James A., 12 W. 40th St.. New York, New York Co.
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Sprague, L. S., Williamson, Wayne Co.
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*Squire, T. H., 409 E. Church St., Elmira, Chemung Co.
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Sweet, Joshua J., Unadilla, Otsego Co.
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Taber, R. C., Tonawanda, Erie Co.
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Thompson, R. A., Norwich, Chenango Co.
Thornton, William H., 570 Niagara St., Buffalo, Erie Co.
Thwing, Clarence, 156 St. Mark's Ave., Brooklyn, Kings Co.
Todd, John B., Parish, Oswego Co.
Tompkins, Fred J., 128 2d Ave., Lansingburgh, Rensselaer Co.
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Tripp, John D., Auburn, Cayuga Co. Original.
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Ure, Heman D., Wampsville, Madison Co.
Vanderhoof, Frederick D., Phelps, Ontario Co. Original.
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Van Wyck, Richard C., Hopewell Junction, Dutchess Co. Original.
Van Zandt, Henry C., Schenectady, Schenectady Co. Original.
Vaughn, Frank O., 249 Swan St., Buffalo, Erie Co. Original.
Vincent, Ludger C., 52 W. 26th St., New York, New York Co.
Wagner, Charles Gray, State Hospital, Utica, Oneida Co.
Wakeley, Benjamin C., Angelica, Alleghany Co. Original.
Wales, Theron A., Elmira, Chemung Co. Original.
Wallace, Edwin E., Jasper, Steuben Co.
Wallach, Joseph G., 159 E. 62 St., New York, New York Co. Original.
Walser, William C., Port Richmond, Richmond Co.
Walsh, Simon J., 22 City Hall Place, New York, New York Co.

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Ward, Stanley M., 417 Adams St., Scranton, Pa. Original.
Warner, John W., 107 E. 72d St., New York, New York Co.
*Webb, Edwin, Hempstead, Queens Co. Original.
Welles, S. R., Waterloo, Seneca Co.
Wells, E. H., Binghamton, Broome Co.
Wells, William L., New Rochelle, Westchester Co. Original.
West, Joseph E., 171 Genesee St., Utica, Oneida Co.
West, M. Calvin, Rome, Oneida Co.
Weston, Albert T., 128 W. 29th St., New York, New York Co.
Wheeler, Isaac G., Marilla, Erie Co.
*White, Francis V., 222 E. 31st St., New York, New York Co.
White, Whitman V., 1522 Park Ave., New York, New York Co. Founder.
White, William T., 1024 Park Ave., New York, New York Co. Founder.
Whitford, James, Onondaga Valley, Onondaga Co. Original.
Wieber, George, 181 S. 5th St., Brooklyn, Kings Co. Original.
Wiener, Joseph, 150 E. 61st St., New York, New York Co. Founder.
Williams, William H., 207 17th St., Brooklyn, Kings Co. Original.
Willis, A. B., Johnsonville, Rensselaer Co.
Willoughby, M., 1335 Main St., Buffalo, Erie Co.
Williamson, Edward A., Westchester Road, Westchester Co.
Wilson, Thomas, Claverack, Columbia Co. Founder.
*Wood, Charles S., 171 W. 47th St., New York, New York Co. Founder.
Woodend, William D., Huntington, Suffolk Co. Founder.
Woodward, C. H., Batavia, Genesee Co.
Woodworth, T. Floyd, Kinderhook, Columbia Co.
Wyckoff, Cornelius C., 482 Delaware St., Buffalo, Erie Co. Founder.
Wyckoff, Richard M., 532 Clinton Ave., Brooklyn, Kings Co. Founder.
Wyeth, John A., 267 Madison Ave., New York, New York Co.. Original.
Young, Augustus A., Newark, Wayne Co. Original.
Young, John, Fishkill-on-Hudson, Dutchess Co. Original.
Young, John D., Starkville, Herkimer Co. Original.
*Young, Oscar H., Sidney Centre, Delaware Co. Original.
Young, William, Cold Spring, Putnam Co. Founder. Total, 732.

Of 164 Founders, 131 remain on the list; of 286 Original Fellows, 258 remain on the list.

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DECEASED FELLOWS.

Name.	Age.	County.	Place of Birth.	Date of Death.	Medical College.	Year of graduation
Adams, John G.	77	New York	New York city	June 19, 1884.	Coll. Phys and Surg., N. Y.	1830
Andrews, John S.	61	Kings	Bristol, Conn.	Jan. 3, 1889.	Univ. City of New York.	1849
Ashton, Isaiah H.	39	Westchester	Philadelphia, Pa.	Feb. 16, 1889.	University of Pennsylvania	1870
Avery, George W.	61	Chenango	Earlville, N. Y.	Nov. 1, 1888.	Albany Medical College	1850
Ayres, Alexander	74	Montgomery	Oppenheim, N. Y.	Aug. 27, 1886.	Castleton, Vt.	1842
Barker, A. M.	37	Erie	Kendall, Orleans Co., N. Y.	Dec. 6, 1887.	University of Buffalo	1877
Bucklin, Daniel D.	70	Rensselaer	Brunswick, N. Y.	April 19, 1890.	Albany Medical College	1846
Budd, J. Henry	45	Ontario	United States	Feb. 25, 1890.	Buffalo Medical College	1875
Case, Mary W.	33	Rensselaer	New York state	Aug. 19, 1889.	Woman's Med. Coll., Phila.	1882
Church, Allen S.	62	New York	Great Barrington, Mass.	Oct. 24, 1884.	Castleton, Vt.	1848
Clark, Alonzo	80	New York	Chester, Mass.	Sept. 13, 1887.	Coll. Phys. and Surg., N. Y.	1835
Coit, William N.	52	Clinton	Plattsburgh, N. Y.	Aug. 4, 1886.	University of Pennsylvania	1856
Collins, Isaac G.	58	Westchester	Granville, N. Y.	Dec. 18, 1885.	Albany Medical College	1858
Collins, Thomas B.	61	Monroe	Mendon, N. Y.	Feb. 17, 1888.	Jefferson M. C., Philadelphia	1851
Cornell, F. O.	29	Montgomery	Glenville, N. Y.	Dec. 3, 1884.	Albany Medical College	1880
Cotes, J. R.	54	Genesee	Batavia, N. Y.	Mar. 20, 1884.	Med. Dep. Univ. Buffalo	1852
Davidson, John	91	Queens	New York city.	Dec. 26, 1884.	Lic. N. Y. St. Med. Soc.	1829
De La Mater, S. G.	73	Schenectady	Bethlehem, Alb. Co., N. Y.	June 23, 1888.	Albany Medical College	1842
Eager, William B.	65	Orange	Orange Co.	Jan. 1890.	Coll. Phys. and Surg., N. Y.	1848
Edgerly, Edward F.	50	Essex	Moriah, Essex Co.	June 23, 1889.	Albany Medical College	1864
Elder, Jennie S.	32	Onondaga	Syracuse, N. Y.	Feb. 2, 1889.	Med. Dept. Syracuse Univ.	1878
Flint, Austin	73	New York	Petersham, Mass.	Mar. 13, 1886.	Harvard Med. Coll.	1833
Flood, Patrick Henry	72	Chemung	Pennsylvania	Mar. 12, 1886.	Geneva Med. Coll.	1845
Fuller, Winfield S.	48	Monroe	Walworth, N. Y.	Jan. 13, 1888.	College of Phys. and Surg., N.Y.	1861

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Gay, Charles C. F.	66	Erie	Pittsfield, Mass.	Mar. 27, 1886.	Berkshire Med. Coll.	1846
Gray, John Perdue	61	Oneida	Half Moon, Pa.	Nov. 29, 1886.	University of Pennsylvania	1849
Gray, John W.	53	Livingston	America.	April 17, 1886.	University of New York	1856
Griswold, Gaspar	29	New York	New York city	Mar. 4, 1886.	Bellevue Hospital Med. Coll.	1878
Guernsey, Desault	55	Dutchess	Wilton, N. Y.	Dec. 9, 1885.	Coll. Phys. and Surg., N. Y.	1850
Hall, H. C.	41	Broome	America.	June 1, 1887.	Univ. of New York, Med. Coll.	1869
Hall, John E.	38	Albany	New Marlboro', Mass.	Nov. 3, 1886.	Albany Med. Coll.	1877
Hamilton, Frank H.	73	New York	Wilmington, Vt.	Aug. 11, 1886.	University of Pennsylvania	1835
Hinds, Frederic J.	32	Washington	East Greenwich, N. Y.	April 26, 1887.	Bellevue Hospital Med. Coll.	1876
Hollister, Edwin O.	41	Ontario	Batavia, N. Y.	Oct. 8, 1887.	Bellevue Hospital Med. Coll.	1874
Hutchison, Joseph C.	60	Kings	Old Franklin, Mo.	July 17, 1887.	University of Pennsylvania	1848
Hyde, Frederick	80	Cortland	Whitney Point, N. Y.	Oct. 15, 1887.	Fairfield Med. Coll.	1836
King, James E.	66	Erie	Warren, Pa.	Jan. 21, 1888.	Buffalo Medical College	1848
Knapp, John H.	67	Cortland	New Fairfield, Conn.	April 30, 1886.	Chenango County Med. Soc. Geneva Med. Coll.	1843 1861
Lauer, Eugene	40	New York	Germany	Oct. 31, 1886.	Giessen and Marburg.	1868
Lester, Sullivan W.	40	Rensselaer	Niantic, Conn.	Jan. 5, 1890.	Med. Dept. Univ. City of N. Y.	1881
Linsly, Jared	84	New York	Northfield, Conn.	July 12, 1887.	Coll. Phys. and Surg., N. Y.	1829
McClellan, Christopher R.	73	Kings	Maryland	Jan. 13, 1887.	University of Maryland	1835
McTammany, Wm. F.	36	Rensselaer	Troy, N. Y.	July 21, 1888.	Bellevue Hospital Med. Coll.	1880
Moore, Joseph W.	47	Albany	Troy, N. Y.	Sept. 9, 1886.	Castleton, Vt.	1859
Morrell, Isaac	79	Chemung	Cornish, Maine	Sept. 8, 1887.	Bowdoin Medical College	1832
Pask, William	55	Erie	England	Aug. 24, 1884.	Med. Dep. Univ. Buffalo	1884
Peck, M. R.	62	Warren	Sand Lake, N. Y.	April 4, 1884.	Albany Med. Coll.	1851
Pomeroy, Charles G.	71	Wayne	New York	Dec. 14, 1887.	Ontario County Med. Soc. Jefferson Med. Coll.	1837 1850
Pryer, William Chardavoyne	54	Westchester	New York city	Sept. 24, 1888.	Coll. Phys. and Surg., N. Y.	1862
Purdy, Isaac	57	Sullivan	Walkill, N. Y.	Dec. 6, 1885.	Castleton, Vt.	1851

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DECEASED FELLOWS—*Concluded.*

Name.	Age.	County.	Place of Birth.	Date of Death.	Medical College.	Year of graduation
Reynolds, Rufus C.	79	Monroe	Columbia, Herkimer Co.	Dec. 22, 1886.	Fairfield Med. College, N. Y.	1830
Ring, William	63	Erie	United States	April 20, 1887.	University of Buffalo	1848
Robinson, Joseph W.	49	Steuben	Angelica, N. Y.	Jan. 4, 1887.	Buffalo Medical College	1862
Rochester, Thomas F.	63	Erie	Rochester, N. Y.	May 24, 1887.	University of Pennsylvania	1848
Sabin, Robert Hall	56	Albany	Saxton's River, Vt.	Dec. 4, 1888.	Albany Med. Coll.	1856
Sayre, Lewis Hall	38	New York	New York city	Jan. 2, 1890.	Bellevue Hosp. Med. Coll.	1876
Schoonmaker, E. J.	65	Seneca	Ulster Co., N. Y.	Aug. 19, 1889.	Geneva Medical College	1848
Skiff, George V.	53	New York	Pike, N. Y.	Jan. 28, 1890.	Univ. City of New York	1860
Slack, Henry	57	Dutchess	Albany, N. Y.	Dec. 10, 1886.	Albany Med. Coll.	1852
Slocum, J. O.	65	Onondaga	Pompey, N. Y.	Mar. 3, 1885.	Castleton, Vt.	1846
Squire, Truman Hoffman	66	Chemung	Russia, Herkimer Co.	Nov. 27, 1889.	Coll. Phys. and Surg., N. Y.	1848
Steele, Charles G.	27	Erie	Buffalo, N. Y.	Feb. 12, 1888.	University of Buffalo	1886
Stevens, Frederick P.	31	New York	Ithaca, N. Y.	Dec. 4, 1884.	Bellevue Hospital Med. Coll.	1877
Stevenson, William G.	44	Rockland	Troy, Ohio	Feb. 3, 1888.	Bellevue Hospital Med. Coll.	1864
Sutton, George Samuel	63	Dutchess	Louisville, N. Y.	Sept. 6, 1888.	Coll. Phys. and Surg., N. Y.	1859
Taylor, Isaac E.	79	New York	Philadelphia, Pa.	Oct. 30, 1889.	University of Pennsylvania	1834
Webb, Edwin	85	Queens	Devonport, England	Jan. 29, 1890.	Coll. Phys. and Surg., N. Y.	1825
White, Francis V.	56	New York	New York city	Oct. 9, 1889.	Univ. City of New York	1855
Winship, Cornelius A.	62	Rensselaer	Litchfield, Conn.	Feb. 14, 1888.	Albany Medical College	1858
Wood, Charles S.	65	New York	Litchfield, Conn.	Feb. 1, 1890.	Jefferson Med. Coll., Phila.	1851
Young, Oscar H.	43	Delaware	Pennsylvania	Jan. 21, 1889.	Jefferson Med. Coll., Phila.	1876

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